



FRIDAY, NOVEMBER 9.

The Gibbon Boltless Rail Joint.

The accompanying engraving represents a rail-joint invented by Mr. Thomas H. Gibbon, of Albany, N. Y., who has had over 25 years' experience in the construction and repair of railroad track. The joint consists of a head 4 in. long, made of the same shape as the head of the rail, with a side-plate fitting the shank of the rail on each side and a slotted angle-plate also on each side. The whole joint, head, angle-plates and side-bars are of steel, and are cast in one piece. The only other piece used in the joint is a flat wrought-iron plate 8 in. wide and $\frac{1}{2}$ in. thick. In making a joint in the track it is necessary to cut off the head of each rail for 2 in. from the end. The joint is then placed over the ends of the rails, the angle-plate being boxed down into the tie on each side, the flat iron plate is slipped through the slots in the angle-plate and under the ends of the rails, four spikes are driven into the tie through the holes in the plate, and the joint is complete. The necessary allowance for expansion must, of course, be made in placing the rails.

In the engraving at 1 are shown the rails in place ready for the joint; at 2 the joint itself, ready for use; at 3 one of the flat plates which rest on the tie; at 4 the joint in place, ready to receive the plate, and at 5 the joint completed and spiked down.

The advantages claimed for this joint by the inventor are that it combines the good features of the old chair joints

It is not the want of knowledge, but the uncertainty attending information obtained only the week before that causes most of the ceaseless volley of questions asked of the ticket agent, or when he is too busy renders necessary a "Bureau of Information."

MORNING.

Fast Work on a Tunnel.

MOSHANNON TUNNEL, Pa., Nov. 5, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The following is a statement of working hours, number of shifts, and distance run during the month of October in the heading of the Moshannon Tunnel on the Beech Creek, Clearfield & Southwestern Railroad, near Snow Shoe, Pa.

The material encountered in driving this heading was the sandstone lying immediately below the lowest or "E" vein of the Clearfield bituminous coal formation.

The details of the work are as follows:

Number of headings 2
Dimensions of heading 7 ft. 16 ft.
Distance run from Oct. 1 to 31 inclusive 490 ft.
Number of shifts 50
Hours per shift 11

The drills used were two Ingersoll, supported on columns in each heading. The system of working was the American "Centre cut." The best work for one week of 11 shifts was 119 ft.

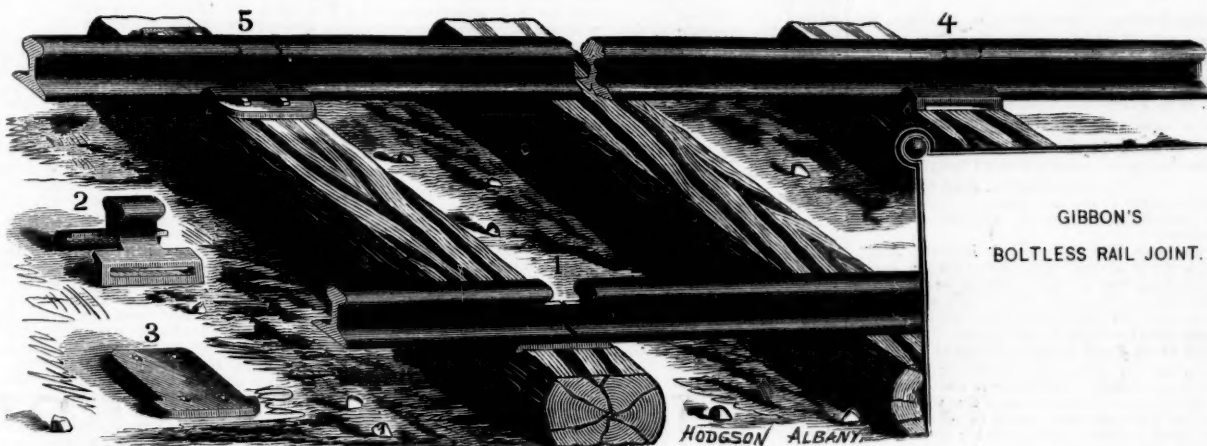
Each heading was closely followed by a "bench" over which ran the pipes conveying compressed air to the drills in the heading. As it was necessary to disconnect these pipes when blasting on the bench, the progress of the heading was somewhat retarded.

We claim this as the best time on record, and as the question is of general interest, and a discussion of the facts most desirable, we beg you to publish this claim in your valuable paper.

J. J. J.

years (until now) for a biography of the immortal reformer Luther, written in just the right light, as Professor Köstlin's is pronounced to be. These are illustrations of the well-known principle that distance gives a true perspective that can be obtained in no other way. Distance in space has, to a certain extent, the same influence as distance in time, whence I conceived that possibly a view, from this remote region, of the Commissioners' report on the late West Shore collision might discern relations between the various points at issue different from those shown in the report. The full text of the report (executed on the typewriter) has just been handed me by the enterprising agent of the New York, Jagoold & Nova Zembla Cable Co., and its perusal has confirmed me in the opinion that your commission is composed of clear-headed men, and their very full and lucid statement of the circumstances attending this tragedy at first sight leaves nothing to be desired; but the brevity of their summary or conclusion, and a careless remark dropped by a narrow-minded and prejudiced friend of mine to the effect that the Board appeared to be just a very little blinded by the "splendid" aspect of the West Shore road and its plans, led to a second thought and suggested one or two queries.

First, why is so little said about the operator? Did he strain every nerve to catch that train? I used to be an operator, and if there was anything that ever woke me up it was to have a fear that a train for which I held orders was liable to get by me; I don't know as I could make 900 ft. in one minute, or even in two, but I think I would have made a very desperate attempt in this case. I have no desire to heap blame on the operator's head; heaven knows they often enough receive censure that belongs on the management, but the Board seems to allow the operator's directions from headquarters to shield him perhaps too much.



GIBBON'S
BOLTLESS RAIL JOINT.

and the modern angle-plates; that it is much more simple and has fewer parts than the fish-plate or angle-plate joints, and that it dispenses with the necessity of cutting bolt holes in the rail. It is also claimed that it will dispense with much of the labor and watchfulness now required to keep the nuts screwed up on the joints in use, and will prevent the occurrence of loose joints, while the flat plate spiked down to the tie will prevent the track from creeping.

The accompanying table shows the result of a test made of one of these joints in a testing machine by Fairbanks & Co. A trial of this joint is also being made in the track in constant use near Albany.

This rail-joint is made by the Gibbon Boltless Rail Joint Company, whose office is at No. 26 North Pearl street, Albany, New York.

TEST OF GIBBON'S BOLTLESS RAIL JOINT, MADE BY FAIRBANKS & CO., A. B. ABBOTT, ENGINEER IN CHARGE.

MATERIAL.	Length of test piece	STRESS, TENSILE, IN POUNDS		Strain, deflection in inches ..
		Elastic limit.	Maximum.	
Rail-joint, 62-lbs. rail, connected by steel casting and iron plate. Joint placed on wood bearings.	28 in.	1,000		.009
		6,000		.100
		11,000		.200
		16,000		.287
		21,000		.355
		26,000		.525
		31,000		.690
		36,000		.810
		37,600	42,700	

REMARKS.—Joint failed by cracking the steel casting through the base at three points, and by bending the plate on which the rails bear. Rails uninjured.

Contributions.

Too Many Changes of Time.

CLEVELAND, O., Nov. 5, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

While you are discussing time tables it has occurred to me that if railroad companies would not change their tables so often it would be another step in the right direction.

Recording the Speed of Railroad Trains.

TO THE EDITOR OF THE RAILROAD GAZETTE:

For some years past the subject of the speed of trains has interested me a great deal, and I have given the matter considerable thought. It has always seemed to me that the exact speed of the train should be known at least to the engineer and conductor. While riding on an engine once I asked the engineer, "How fast are you going?" He replied, "I don't know—about thirty miles." An old engineer who has become accustomed to the road and knows every fence post may make a tolerable good guess at the speed, but on a dark or foggy night this guess would be an exceedingly wild one. I have often "speeded" the train with my watch in hand by counting the mile posts or telegraph posts. If two seconds elapse between telegraph poles, the poles being 180 ft. apart, we are traveling about sixty miles per hour, if three seconds apart, then forty miles, and so on.

The motion of the train, the dust and gravel and the constant whirlwind make it very difficult to connect anything between the revolving wheel and axle and delicate machinery to show the speed. And yet the necessity of a speed gauge is great, and the wonder to me is that locomotives have run so long without them. "A steam gauge and a speed gauge." The time will come when an engine will no more go without one than the other—both are a necessity.

Some two years ago I experimented a good deal to obtain an indication of speed and mileage. My distance register was attached to a coach of the Michigan Central and very accurately kept account of the miles traveled. Conductor Ladd, who accompanied it on one round trip, 570 miles, said it was the first time in his experience that he could tell exactly how fast they were going, and he is an old conductor on the road. The indicator was set at 1 starting from Detroit, and on its return from Chicago had not lost a quarter of a mile.

A company is now forming in Detroit for the manufacture of these mileage and speed indicators for locomotives.

There is not a doubt but the locomotive of the future will be equipped with a speed indicator. E. R. E. COWELL.

The New York Commissioners' Report on the West Shore Collision.

SIBERIA, November, 1883.

TO THE EDITOR OF THE RAILROAD GAZETTE:

George Washington's biography had to wait half a century before an Irving appeared to write it in a perfect manner; and all Christendom has had to wait four hundred

The Board seems to feel rather severe toward the division superintendent, though without fully saying so; but it seems to me that he acted on one or two familiar theories which the Board overlooks. Is it not a fact that division superintendents generally regard themselves as very little, if at all, bound by any set rules? Isn't it almost always understood in general offices that the printed rules are for the lower grades? Do not the men there regard themselves as more or less a part of the power that made the rules and so as possessed of exceptional liberty to vary them? When I was a Division Superintendent on the Alaska Central it was so; the General Manager never cared whether I conformed to the rules or not, so long as I made my inferiors toe the mark, and I think perhaps Mr. Merrill assumed that he had quite wide discretion in the matter; he certainly would not do an unusual thing to so assume.

It seems hard to accuse the dead, and it is perhaps not best to inquire here why the engineman did not investigate the unusual occurrence of two flags exhibited apparently for one purpose; but don't you think, Mr. Editor, that the Division Superintendent feels inclined to attribute all his misfortunes to the fact that the runner did not "stop and learn the exact facts from the person (operator) who flagged him," as is enjoined on so many time-tables? This unfortunate runner had doubtless had extensive experience on other roads, and very likely his mind was, in fact, influenced much more by the general principles he had learned elsewhere than by the exact terms of the new rules he had just been made acquainted with; but the clause requiring train officials to find out exactly what a red flag means is well-nigh universal. And, speaking of old and familiar rules as compared with a new and unstudied code, is it not possible after all that the company is the chief culprit? The Board, indeed, almost says so in the statement that it tried to run trains to soon. This, taken in its full significance, means a great deal; but as it sounds rather tame in the place where we find it, I would have liked to see the Board tell us precisely wherein the road was "too previous," to use an American expression. (We never tolerate slang here.) This point ought to be emphasized, and perhaps even made the subject of more stringent laws; for, so long as railroads are run for the purpose of making money, they will be put in operation at the earliest possible moment, and sad experience in the past warns us that the present lesson will not have its due influence on all future new roads unless it is very persistently reiterated.

In the eye of a conductor or engineman, however, one of the gravest faults on the part of the management is the

patched-up condition of the code of rules. This point is pretty well shown up by the Board and needs no elucidation from me, but I am led to ask if this is not the most widespread of all the evils that contributed to this collision? Is it not a point which is most liable to cause a collision somewhere else, for the reason that it exists in a great many tables? Enginemen and conductors when engaged in the exciting business of running a train on a single-track road are not naturally prepared coolly to compare the different degrees of importance of various new and old rules, and this is an important fact. It lays upon the management the imperative duty of studying brevity and clearness as a fine art. A fresh set of rules on a certain point should not be issued without withdrawing the old ones. The duty of finding out which of the old rules are amended and which of them remain in force ought not to be put upon the trainmen. In the great majority of instances they have to act on rules as they remember them, there being (in their opinion at least) no time to refer to the letter of the law. Whether this is right or not it is the fact, and the present practice of most roads encourages the men to continue doing as they have done. How many, think you, of the enginemen of the West Shore road or any other road have a clear idea of all the rules the management issues to them with the injunction that ignorance of any one, or of its proper bearing on others, will be a grave offence? Very much less than 99 per cent., I am sure.

And yet, is it impossible to frame a code that they can keep well in mind? Let some of your American railroaders answer this. In doing so they will perform a valuable service, both to the railroads and to the people who entrust their lives to them.

CZAR.

Brake-Gear for the Standard Car-Truck.

At the Master Car-Builders' Convention in Chicago, the following letter was submitted as an appendix to the report of the Committee on Standard Freight and Passenger Car-Trucks. The letter was written by Mr. George Westinghouse, Jr., to Mr. Wm. Forsyth, a member of the Committee, in response to a request made by him, and was accompanied by a drawing, which is given herewith, showing a suitable brake-gear for the proposed standard freight truck:

PITTSBURGH, Pa., June 8, 1883.

DEAR SIR: As promised in my last letter to you, I will now make some observations upon the question that has been submitted to me.

Mr. Garey, of the New York Central & Hudson River, gave me a model box car of the latest construction, and I found upon examination that it was entirely suitable for the use of a substantial brake-gear. I will not pretend to go into the question as to whether this truck is all that could be desired, because that question is rather out of my line. I may observe, however, that I think the form of truck is a very excellent one, and one that, with slight modifications, could be accepted as a standard truck for the United States. These modifications can only be made when the size of the maximum wheel and the maximum axle is decided on.

I send you, herewith, a blue print showing the kind of brake-gear I have designed for this freight car. I have had in view in designing this, the reduction of the parts to the smallest number possible, and their suspension or attachment to the truck in such a manner that there will be no likelihood of their getting down to derail the train. The brake-beam, as is shown by the tracing, is made of two pieces of bar iron the form of section of which is a little more than half a circle, and they are welded at the ends. Before welding, a cast malleable centre-bearing for carrying the lever is slipped over the two ends and shrunk in its place. Instead of suspending the brake apparatus by a hanger, one end of which is attached to the frame and the other to the brake-shoe, I have prepared a hanger fixed to the brake-beam so that it is practically rigid. The upper end of this hanger swings in a bracket which should be firmly riveted to the truck frame. The bolt through this hanger I have shown $1\frac{1}{4}$ in. in diameter, the bearing is also $1\frac{1}{4}$ in. long. This pin should be a good fit and perhaps could be case-hardened. The brake-shoe instead of having a hanger slips over the end of the brake-beam. A split pin on the outside of the shoe firmly secures it in its place. The hanger has a spring on it with a pin at the lower end which slips into a lug in the brake-shoe and thus holds the brake-shoe in the proper position. When the brakes are applied, this spring yields and the shoe accommodates itself to the curve of the wheel. You will notice that the shoe has a greater amount of metal to wear at the bottom than at the top. I have adopted this form so that the spring which holds it back will, when the shoe is nearly worn out, not have an excessive amount of work to do. Two brake-levers are used for each truck, in order that each wheel may be subject to exactly the same pressure. The whole of the brake-gear is about 6 in. above the rail, and being suspended from the truck frame, it can never come nearer to the rail than it is when first adjusted. I am having the model car, to which I have referred, fitted with a brake gear made to the same scale, and expect to have it in Chicago at the time of your convention so that you can inspect the apparatus itself. The time that I have had has not permitted me to verify all of the details of this apparatus. However, I have confined myself to forms with which I am familiar; for instance, the brake-beam with round ends. This I have been using very largely on European railways and that form of brake is almost universally used. The brake-shoe is a solid one not made in pieces, and it is more easily replaced than any other form that I have seen. I believe that the losing of a brake-shoe with this arrangement will not occur once where it now occurs a hundred times. The brake-beam and the hanger being practically one piece, the weight of the brake-gear is utilized in releasing the brakes. The truck frame, you will see, is utilized as a stop for the brakes when they are off. The arrangement of brake-rods and levers to connect the brakes of two trucks is a matter that I have not fully determined on. There are so many forms of brakes, however, that there will be no difficulty in easily deciding upon a suitable arrangement.

I have chosen brakes between the wheels for two reasons: First, because it is the most convenient place to attach brake-gear; secondly, because the falling action of the brake-hangers when the brake is attached to the outside of the wheels has a tendency to tip the truck, while the tendency is in a favorable direction when the brake-shoes are suspended between the wheels. The pins for the brakes and the brake-levers, together with their bearings, I have made much larger than is now the practice, not because pins of the present size would not answer so far as

strength is concerned, but because they are so rapidly worn if they are small. When the brakes are suspended to the car-bodies, as is the practice on many roads, the loading of the car tends to release the brakes, and the movement of the car up and down on the springs necessarily causes an unequal brake force to be exerted. For these reasons I think it will be agreed by all that one of the first points in the application of the brake is to suspend it to the truck frame, and not to any portion of the car or truck that moves up and down with the car; the second point will be to make it so substantially that there will be no fear of breakage from any strain that can be brought upon it, and so that the apparatus cannot get down under the wheels. If the first proposition is true then some form of truck ought to be adopted similar to that shown in this drawing. Transoms made of channel iron I think are preferable to those made of wood. It is true they cost more, but they would materially assist in making a reasonably stiff truck frame and would admit of the attachment of a good brake-gear. I would recommend, however, in deciding upon the standard truck, the adoption of a larger wheel than the standard 33 in. A wheel 3 ft. in diameter could probably be used, in which case centres would have to be at least 3 in. farther apart than they are shown by the engravings.

In regard to the size of the axle and axle-box, this a matter which can only be settled by experiment. I have a strong conviction that a journal 5 in. by 9 in. or 10 in. in length would prove in the end the most desirable. The pressure per square inch on the brasses would be reduced a sufficient amount to insure a much more perfect lubrication than railway people are now accustomed to, where the journals are so small compared with the weight that must be carried. The representatives of the Pennsylvania Railroad may be able to give you information on this point, for it was arranged recently, while I was in Altoona, that they would make some experiments with journals of the dimensions above, even. As to whether the swing-beam truck is desirable or not I am not able to say from my experience, but I am inclined to think a considerable advantage is to be gained by its use. If a swing truck is desirable then there is all the more reason for not attaching the brakes to the bolster or car.

I do not pretend to have written you more than a letter on this subject. To prepare a report such as ought to be submitted to the Master Car-Builders for their acceptance, will require the attention of those who are directly interested in every detail of the car. I trust the observations I have made may prove of service to you, and if you have any questions to ask relating to this subject, I will answer them to the best of my ability.

Will you be kind enough to lay this letter and the drawings before the other members of the Committee on Car Trucks and Brakes?

GEO. WESTINGHOUSE, JR.

The Late William Swinburne.

Mr. William Swinburne died yesterday afternoon at 10 minutes after 3 o'clock at his residence on the corner of Straight and Van Houten streets. The cause of his death was the general breaking down of the system consequent upon old age, Mr. Swinburne being in his 79th year. It was at first thought that there was some heart trouble on account of the faint action of that organ, but the progress of the illness showed that there was no ground for such a supposition. He continued getting worse, and died after having suffered a great deal.

William Swinburne was born in Brooklyn in 1805. While working at his trade as a carpenter, at the age of 18, Mr. Swinburne assisted in building the old St. Ann's Church, opposite the Sands street Methodist Church, Brooklyn. In St. Ann's Church were 1,500 small window lights in Gothic shapes, with circular-headed frames, and these sashes were the work of Mr. Swinburne. This church, after standing about 57 years, was razed to make way for the march of improvement in the shape of the Brooklyn Bridge. In 1827, when Mr. Swinburne was about 22 years of age, he was married to Miss Melissa Doughty, of Matteawan, to which place he had removed. At Matteawan he was engaged until 1823 in making patterns for machinery, etc. In that year he came to Paterson, and went to work for Rogers, Ketchum & Grosvenor, in the Jefferson Works, then just completed. The product was cotton machinery almost exclusively. Mr. Swinburne made the patterns, and soon attracted attention by his skill and industry. At this time Paul & Beggs were running their works, nearly as extensive as those of Rogers, Ketchum & Grosvenor, and turning out mill-gearing, they being the only millwrights to be found within all the section of country about Paterson, and sending out men to a great distance to put up their work and equip new mills. When the fire occurred which consumed the establishment of Paul & Beggs, about 1835, together with all their patterns for mill-gearing, invaluable in those days, mill-owners were driven to Rogers, Ketchum & Grosvenor to induce the firm to go into the production of mill-gearing. What was left of the plant of Paul & Beggs was taken by Rogers, Ketchum & Grosvenor, and a millwright shop was built on the southeast corner of Spruce and Market streets. Here the new line of work was undertaken, Mr. Swinburne making all the patterns, being, in fact, about the only one capable of doing it at the time. When the Paterson & Hudson River Railroad, from Jersey City to Paterson, was completed Mr. Swinburne went to see its operation, when only a trial-trip had been made over the road. The Paterson depot was where St. John's Catholic Church now stands. He was greatly impressed with the wonders of the iron horse on the iron track, and he said he would have deemed any one mad who told him that he would one day build a better locomotive than the English built "McNiel." So he kept on making patterns at the millwright shop until, in 1835, the building of the "Sandusky" was begun and his services were required in a new direction. Great expectations were entertained by the firm as to the result of the skill of Mr. Hodge, an English mechanical draughtsman, in whom every confidence was placed in connection with the production of the first locomotive. It was said that he was a very accomplished man, but he was not a genius, and it was soon clear that he had undertaken a task he was utterly unfit for. In the beginning Mr. Swinburne was employed in making patterns after his drawings, but soon the natural talent of the former enabled him to see that no good could result from Mr. Hodge's plans. He convicted him in argument of being from 25 to 30 per cent. out of the way in his calculations as to the passages from the boiler to the steam-chest, and demonstrated so clearly that he, Mr. Swinburne, was right that the other, whose pride was terribly wounded, was compelled to acknowledge his error. But he fell into others. He had the boiler made first, and so far astray were his calculations that when it was completed there was found to be not space enough to put the furnace in the shell. There were other difficulties also, and at last Mr. Rogers discharged him. Then Mr. Rogers, discouraged and hopeless, determined to lay the whole business aside, but Mr. Swinburne assured his employer that there would be no difficulty in getting it out. He was told to go ahead, and he did so. Mr. Swinburne went to the depot and examined the different parts of the "McNiel" with the practiced eye of a skilled mechanic and

a natural genius combined. Six months later the "Sandusky" was completed and was a perfect success. Mr. Swinburne did, or directed, everything toward the work, making the patterns and showing the workmen how to produce the requisite parts. After the success of the "Sandusky" the firm continued to build locomotives, and for the next one built after the "Sandusky" Mr. Swinburne made the plans and was general factotum, serving as draughtsman, pattern-maker, superintendent of construction and foreman of foundry, blacksmith and machine shops.

William Swinburne's locomotive works were located at the corner of Market street and the Erie Railway, the present site of the Erie repair shops. They were erected in 1851 by him on his retirement from the New Jersey Locomotive & Machine Co. Here Mr. Swinburne, the pioneer locomotive builder of Paterson, established himself and took the initiative in the use of steam power for driving heavy machinery. This was the first large concern in Paterson the machinery of which was driven by steam. At the new works business was prosperous and orders plenty. From 200 to 300 men were employed. The product was solely locomotives. The panic of 1857 came, and this prosperous industry, sharing the fate of many others of all classes, was wiped out of existence. Of course this and other losses at that time crippled him, and he discharged his employees, save enough to finish up the locomotives on hand. Then he set to work to get what he could out of the wreck. Engines shipped before the collapse and not paid for, seeing the bank of deposit had failed, were seized by creditors on the way to their destination. Finally Mr. Swinburne went West to try and collect what he could of about \$8,000 secured by bond and mortgage on Western farms. He in some instances offered to take 80 per cent. on these and cancel them, but the money could not be had, and his success was poor. While engaged in this hopeless task Mr. Swinburne fell into the hands of a slippery Western lawyer. By Judge Dickerson's advice he sent \$15,000 worth of the best securities to a Milwaukee attorney to collect, and after a few remittances it was found out that the lawyer had collected about \$90,000 for different parties and had then decamped. Mr. Swinburne was not coaxed to close up business, but he was weary of the struggle. Afterward he sold his buildings, the Bank of Jersey City becoming purchaser, and he retired from business honorably, but with very little to show for the labor of a lifetime. He had been a quarter of a century employed in locomotive building exclusively, and nearly all was swept away. The total number of locomotives turned out by Mr. Swinburne was 104, and of these 23 were completed in 1852, 31 in 1853, 22 in 1854, 9 in 1855, 11 in 1856, and 8 in 1857. Then came the end, and one locomotive building establishment—and the only one that has become extinct since the business was undertaken in Paterson in 1835—was blotted out.

Mr. Swinburne leaves three children, Mrs. John J. Brown, Mrs. Sarah Cooke, widow of the late John Cooke, and Miss Carrie Swinburne, the latter of whom resided with him to the time of his death. His son, Mr. John Swinburne, for many years cashier of the First National Bank, died some time ago. The wife of the elder Mr. Swinburne died in 1867. The deceased still has a brother living in White Plains, Westchester County, New York—Professor John Swinburne. The deceased for a long number of years belonged to the Methodist church, but in the later days of his life he studied the Bible and theological works by himself, as the infirmities of old age prevented him from joining in discussion with others or listening to sermons.

In politics Mr. Swinburne was always a staunch Republican. In 1861 he was elected President of the Board of Education and Superintendent of the Public Schools of this city, these two offices having been merged into one. He was subsequently Secretary of the Board and School Superintendent one year longer. He was then chosen Comptroller of the city, a position he held for ten years. He was a School Commissioner in 1854, having been elected from the East Ward; he was also School Commissioner in 1866 and 1867, having been elected also from the East Ward. In his many years of public life he was always an efficient officer, greatly liked for the many good qualities which endeared him to all who became acquainted with him. He was a very quiet and unassuming man, although of great mental acuteness and energy. He will be sadly missed by the family and circle of friends among whom for the last years of his useful life he had been an object of reverent and devoted interest.—*Paterson (N. J.) Press, Nov. 5.*

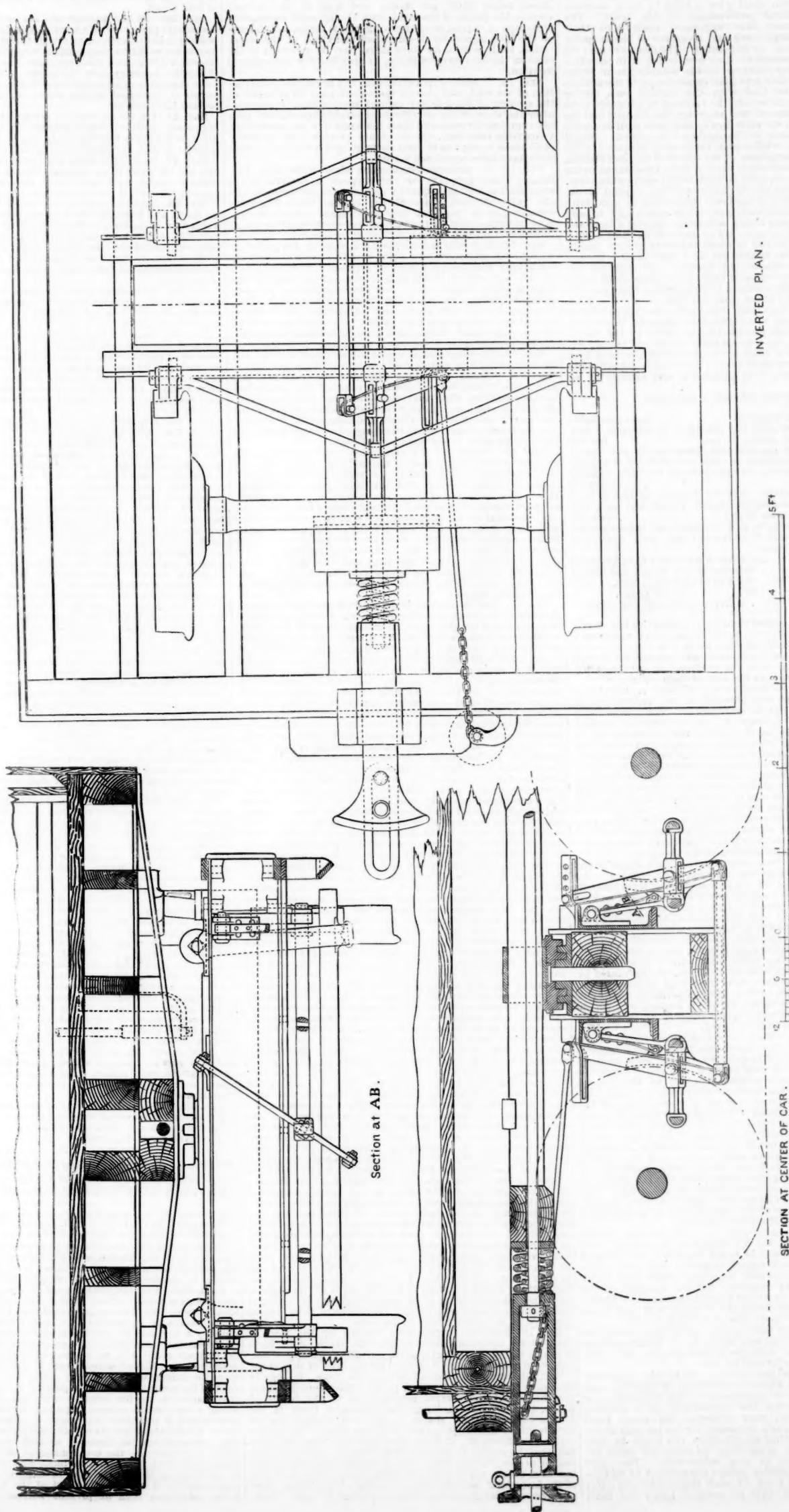
The New Hampshire General Railroad Law.

The following is the full text of the General Railroad law recently passed by the New Hampshire Legislature, which is of more importance as affecting combinations of existing companies than as providing for the formation of new ones: Be it enacted by the Senate and House of Representatives in General Court convened:

SECTION 1. Any number of persons not less than 25, a majority of them being inhabitants of this state, may associate themselves together, by written or printed articles of agreement, for the purpose of forming a railroad corporation, and, upon complying with the provisions of this act and of such of the general laws of the state as relate to the formation and organization of railroad corporations not inconsistent with this act, shall, with their associates and successors, be and remain a corporation, with all the powers and privileges, and subject to all the duties, liabilities, and restrictions set forth in this act, or in the laws of this state applicable to railroad corporations, and incident to corporations of a similar nature.

SEC. 2. The articles of the association shall state the name of the corporation, the termini of the railroad proposed to be built, its length as near as may be, and the name of each city, town and county through or into which its route extends, its gauge, the amount of the capital stock of the corporation, which shall not be less than \$15,000 for each mile when the gauge is more than 3 ft., and not less than \$6,000 for each mile when the gauge is 3 ft. or less, and shall be divided into shares of \$100 each, and the names of at least seven persons to act as a board of directors until others are chosen by the corporation. Each associate shall subscribe to the article his name, residence, post-office address, and the number of shares of stock which he agrees to take, but no subscriber shall be bound to pay beyond 10 per cent. of the amount of his subscription unless the corporation is established.

SEC. 3. The corporate name assumed shall be one not in use by any other corporation in this state, and shall be changed only by act of the Legislature. The associates may from time to time, at any meeting called for the purpose, reduce the amount of the capital stock, but not below the limit prescribed in the preceding section, and not to reduce the par value below \$100 per share; and they may in like manner change the gauge of their road. The directors shall be subscribers to the articles of association, and a majority of them shall be inhabitants of this state. They shall appoint a clerk, who shall be an inhabitant of this state and shall be sworn to the faithful discharge of his duties, and who shall record the doings of the directors and proceedings



INVERTED PLAN.

SCALE

SECTION AT CENTER OF CAR.

Section at AB.

of the association. They shall also appoint a treasurer of the association, who shall give a bond to their satisfaction for the faithful performance of his trust. The clerk and treasurer thus appointed shall hold their respective offices until clerk and treasurer of the corporation are duly chosen or appointed. The directors may fill any vacancy happening in their own board or in the office of clerk or treasurer previous to the establishment of the corporation. The directors shall cause a copy of the articles of association to be filed with the clerk of each city or town through or into which the railroad is proposed to be located, with a plan of line showing the termini and the length of railroad in each town, and also shall cause the articles of association to be published in some newspaper in each county in which said railroad is proposed to be located; and the certificate of the clerk of the association, or the affidavit of any other person, upon or annexed to the articles of association, shall be evidence of such publication.

SEC. 4. Whenever the full amount of the capital stock, as provided in section 2, has been subscribed in good faith by responsible persons, such association may apply to any justice of the Supreme Court, who shall appoint a time and place of hearing, give such notice thereof as justice may require, and when it shall be made to appear to such justice that the requirements of this act and such of the general laws of the state as relate to the formation of railroad corporations have been complied with, such justice shall annex to such articles of association a certificate that these requirements of the law have been complied with.

SEC. 5. The directors shall thereupon cause the articles of association, with all the certificates indorsed thereon or annexed thereto, to be recorded in the office of the Secretary of State, who, upon the payment to him of his reasonable charges therefor, shall record the same in a book kept for that purpose, and shall issue a certificate substantially in the following form, to be annexed to said articles of association:

THE STATE OF NEW HAMPSHIRE.

Be it known, that whereas have associated themselves together with the intention of forming a corporation under the name of the , for the purpose of locating, constructing, maintaining and operating a railroad (description of road, as in articles of association) and have complied with the laws of this state relating thereto, therefore, I, Secretary of State, do hereby certify that the persons aforesaid, their associates and successors, are legally established as a corporation under the name of the , with all the powers and privileges, and subject to all the duties, liabilities and restrictions of the laws of this state applicable to railroad corporations.

In witness whereof I have hereunto subscribed my name, and affixed the seal of said state, this.....day of....., in the year.....
[state seal] Secretary of State.

The certificate so executed shall be recorded by the Secretary of State, and the same, with the articles of association and certificates annexed thereto, shall also be recorded in the books of the corporation; and the original, or a duly certified copy thereof, shall be evidence of the establishment of the corporation at the date of such certificate.

SEC. 6. Upon the issue and record of such certificate the directors may call the first meeting of the corporation at such time and place in this state and for such purposes as they may think the interests of the corporation require, which shall be notified by the clerk of the association by depositing in the post-office, prepaid to the place of their destination, written or printed notices of the time, place and objects of such meeting, by him signed seven days at least prior to the day of such meeting, addressed to each stockholder or subscriber for stock at his post-office address; and said clerk shall make a record of his doings in notifying such meeting in the records of the association. At such first meeting, or any adjournment thereof, the corporation may adopt by-laws, choose directors, and all necessary officers and agents, and transact any other business of which notice has been given in the notification of the meeting.

SEC. 7. When the corporation has been duly organized as herein provided, the directors may apply by petition to the Supreme Court, at the law term or adjourned term thereof, setting forth the facts relating to the establishment and organization of the corporation, its termini, and the route on which it is desired that said railroad shall be located, to determine whether the public good requires the laying out and construction of said railroad. Said Court shall forthwith give such notice as justice may require, and, if no sufficient objection is shown, may refer said petition to the Railroad Commissioners, or to three referees to be appointed by it, who shall give notice, hear the parties as county commissioners are required to do in cases of petitions relating to highways referred to them, at which hearing any person whose business or property may be affected by such laying out, and construction, shall be heard.

SEC. 8. Such commissioners or referees shall report to the Court whether, in their opinion, the public good requires the laying out, construction and operation of such railroad on the route set forth in such petition, and shall locate the same in the same manner as that provided by the general laws for the location of a railroad: Provided, that such location shall not be made on or over any portion of any of the routes for which charters have already been granted to any existing railroad corporation not yet located, unless such corporation shall fail to file a location of its route, as now provided by law, on or before the time limited in its charter, and that no location shall be made upon or over any portion of the location of any railroad except when necessary for connections and crossings: Provided, that this act shall not prevent the location and construction of a railroad from North Stratford to the Canada line by any railroad corporation after the expiration of the time limited in the charter of the Boston, Concord & Montreal Railroad.

SEC. 9. Any person aggrieved by the decision of the Court or referees may file his objection, in writing, with the Clerk of the Court, and be heard thereon at the term of the Court at which such report is made: and said Court may render judgment on said report, or make such order therein as justice may require; and the location of the route of said railroad, as fixed by the decision of said Court, shall be recorded by the Secretary of State, and said route may be changed in the mode now prescribed by law.

SEC. 10. If said Court shall render judgment laying out said railroad, the directors may apply to the Railroad Commissioners to assess the damages to land-holders and other parties interested, as provided by law.

SEC. 11. If the capital stock fixed in the articles of association, upon the filing of which the certificate of establishment was issued, is found to be insufficient for the construction or equipment of the railroad, the corporation, at a meeting called for the purpose, may increase the same from time to time to the amount necessary for the purpose aforesaid, giving the existing stockholders the right to take in the new stock in proportion to their old stock before offering the same to new subscribers. The corporation may in like manner reduce the amount of its capital stock, reducing the stock of each stockholder *pro rata*, provided the stock shall never be reduced below the limit

prescribed in section two, and the par value shall not be reduced below \$100 per share, and may in like manner change the gauge of the road; but if any such increase or reduction of capital or change of gauge is made, a certificate of the fact, signed by the president and clerk of the corporation, shall, within 30 days thereafter, be recorded in the office of the Secretary of State, as provided for the original location.

SEC. 12. If such corporation does not begin the construction of its road, and expend thereon at least 20 per cent. of the amount of its original capital stock within four years after the date of its certificate of establishment, and does not complete its road and open the same for use within six years from said date, its corporate powers and existence shall cease, except as to such parts of said railroad as then shall have been completed for use.

SEC. 13. No railroad corporation shall enter upon any land or other property for the purpose of constructing a road until an amount equal to at least 20 per cent. of the par value of each share of the capital stock has been actually paid in; nor shall any corporation commence running its trains until its paid-up capital stock shall be equal to at least one-half its cost, including equipment.

SEC. 14. Any railroad corporation now or hereafter in operation in this state may build branches or extensions by complying with the provisions of sections 7, 8, 9, 10 and 13 of this act, and to [with] such of the general laws of the state as apply thereto, may issue stock solely for the construction and equipment of such branch or extension. Provided, that such new stock shall be entitled to dividends only at the same rate as may by law be divided on the stock of the corporation before such issue, or without additional capital stock if its indebtedness is not thereby increased.

SEC. 15. No corporation organized to construct its road on a gauge of 3 ft. or less shall change such gauge to more than 3 ft. without complying with all the provisions of law in relation to the capital stock of roads of the gauge last named; and the fact that such provisions have been complied with shall be shown to the satisfaction of one of the Justices of the Supreme Court, and indorsed by him upon the certificate of such change of gauge, before recording the same in the office of the Secretary of State.

SEC. 16. Whenever the railroad of any corporation organized under this act shall be finished and opened for use, the corporation shall, within one year thereafter, cause a map and profile thereof, with tables of grade and curvature, and a statement of other characteristics of the road, in such form as the Railroad Commissioners may prescribe, to be certified by its engineers, and filed in the office of the Secretary of State. Every such railroad corporation shall hold at least one meeting in each year for the choice of such number of directors as the by-laws may prescribe, which shall be called the annual meeting, and this and all other corporate meetings shall be held at such time and at such convenient place in the state as the by-laws may prescribe or the directors appoint.

SEC. 17. Two or more railroad corporations may contract that either corporation shall perform all the transportation of persons and freight upon and over the road of the other, or any road leased or operated by it, and any railroad corporation may lease its road, railroad property, and interests to any other railroad corporation upon such terms and for such time as may be or may have been agreed to by the directors, and as may be or may have been approved by two-thirds of all the votes cast on that subject by the stockholders of each corporation voting according to law thereon at meetings of said stockholders, properly notified and held for that purpose. And two or more railroad corporations may apply to the Supreme Court, at the law term, to determine whether the public good will be promoted by the union of said corporations, and, if said Court shall decide that the public good will be promoted by a union of said corporations, they may unite and form a new corporation, which shall have all the powers, privileges, franchises, property, and rights of every kind, assume and be subject to all the duties and liabilities of the corporations forming such union, or either of them, and of railroad corporations, under the laws of this state and under their several charters, upon such terms and conditions, and with such guarantees as may be or may have been agreed upon by two-thirds of all the votes cast on that subject by the stockholders of each corporation voting according to law thereon, at meetings of said stockholders properly notified and held for that purpose; and may adopt by-laws providing for the number and manner of choosing its directors and other officers, and define their duties and the time and manner of holding meetings of the corporation, and for such other purposes as its interests may require: Provided that the rates for fares and freights existing Aug. 1, 1883, shall not be increased on any part of the roads so leased or united, and the decrease in the operating expenses consequent upon the leasing or uniting of any roads shall be met from time to time by a reasonable and just reduction of fares and freights; but no competing railroads, now prohibited by law from leasing or uniting, shall have a right under the provisions of this act to unite with or lease each other unless said roads, or one of them, has heretofore leased or united with some other road or roads for the purpose of forming a continuous line, or shall hereafter, or at the time of such lease or union, unite with or lease some other road for such purpose. When any railroad is leased under the provisions of this act, said lease shall be recorded by the Secretary of State, and when a new corporation is formed, as provided in this section, the terms of such union shall be recorded by the Secretary of State, and it shall file a map and profile of its road, as required by section 16 of this act; and when such railroad within this state has been organized, or formed by a lease or union of roads organized under the laws of the state, the principal place of business of the corporation, and the offices of the superintendent or general management, shall be located therein, unless otherwise provided by the Legislature. The first meeting of a new corporation formed by the union of two or more existing railroad corporations shall be called by the presidents of the corporations composing such union, or either of them, and seven days' notice shall be given of the time and place of said meeting by publication in one or more newspapers in each county where either of said railroads are [is] located; but nothing in this act shall impair the right of the state to hereafter take any or all of the roads that may be leased or united under it according to the provisions of their several charters, or the general laws of the state.

SEC. 18. Railroad corporations created by the laws of other states, operating roads within this state, shall have the same rights for the purposes of operating, leasing or uniting with other roads as if created by the laws of this state.

SEC. 19. Such new railroad corporation may, if legally necessary to perfect such union, procure the assent of all the stockholders of the several corporations to the terms of union, and they may exchange their shares of stock in the former corporation for shares in the new corporation on such terms as have been agreed to by the votes of the corporations as aforesaid. If from any cause such new corporation shall be unable to procure such consent, such corporation or person holding stock may, if legally necessary to perfect such union, apply to the Supreme Court, have the value of the interest of such stockholder in the corporation, over and above its debts and liabilities, appraised by said Court,

or referees appointed by it, or by a jury under the direction of said Court.

SEC. 20. In like manner said corporation may, if legally necessary, procure the assent of any bondholder or persons holding a lien on the property of the corporation. If from any cause said new corporation is unable to agree with the person holding such bond or other lien, either party may, if legally necessary so to do, apply to the Supreme Court, have the value of such interests in the property of the corporation appraised in the same manner as provided in section 19 of this act.

SEC. 21. On the payment or tender of the amount of such appraisal, with interest to the date of such tender or payment to the party holding such stock, bonds, or lien, the interest of such holder of stock, bonds, or lien shall cease.

SEC. 22. Said corporation may issue new stock or bonds, and sell the same to an amount sufficient to make such payment or tender, and such bonds may be secured by mortgage of its road, if the corporation shall so vote.

SEC. 23. Said corporation may fix the amount of its capital stock, and bring the stock of the uniting corporations to a common basis, but the capital stock of said new corporation shall not exceed the aggregate capital stock of such corporations actually issued and paid for at par at the time of the union, or that may be issued and paid for at par for the construction of branches or extension under section 14 of this act.

SEC. 24. No dividend shall be made by such united corporation to any greater amount in the aggregate than such separate corporations are allowed by law to make at the date of such union.

SEC. 25. Any railroad corporation organized or united under the provisions of this act may issue its bonds for the purpose of constructing, completing, improving or equipping its road, and for the purpose of liquidating the indebtedness of the corporation to an amount not exceeding its capital stock actually paid in at the date of such issue, and may mortgage its road to secure the same if the corporation shall so vote.

SEC. 26. The directors of railroad corporations shall from time to time establish reasonable rates for the transportation of passengers and freight over their railroads; and when two or more railroads, organized under the laws of this state, are authorized by law to connect in any city or town in this state, each of them shall at reasonable times and for reasonable compensation draw over its road the cars, passengers, and freight delivered to it by any railroad which is authorized to enter on and use the same or which is authorized to use any connecting railroad having such authority; and each of them shall, for a reasonable compensation, provide upon its road convenient and suitable depot accommodations for the passengers and freight of the other corporation passing to, from and over it. If the corporations cannot agree upon the terms and conditions upon which accommodations shall be furnished for the passengers and freight of the other, or if two corporations operating roads of different gauges cannot agree as to the requisite terminal accommodations, or as to the manner in which passengers and freight shall be transferred from one road to the other and forwarded, the Supreme Court, upon the petition of either party, and after notice to the other, shall hear the parties, and determine (having reference to the convenience and interest of the corporations and of the public to be accommodated thereby) the terms and conditions upon which such accommodations for passengers and freight, or requisite terminal accommodations and manner of transferring passengers and freight aforesaid, shall be furnished, and upon the application of either party shall determine all questions between the parties in relation to the transportation of passengers and freight; and the award of said Court shall be binding upon the respective corporations for one year, or until said Court shall revise and alter the same.

SEC. 27. No railroad corporation shall charge or receive for the transportation of freight to any station on its road a greater sum than is at the time charged or received for the transportation of the like class and quantity of freight from the same original point of departure to a station at a greater distance on its road in the same direction. Two or more connecting railroads in this state shall not charge or receive for the transportation of freight to any station on the road of either of them a greater sum than is at the time charged or received for transportation of the like class and quantity of freight from the same original point of departure to a station at a greater distance on the road of either of them in the same direction. In the construction of this section, the sum charged or received for the transportation of freight shall include all terminal charges, and the road of a corporation shall include all the road in use by it, whether owned or operated under a contract or lease.

SEC. 28. A railroad corporation which violates any provision of the preceding section, in addition to liability for all damages sustained by reason of such violation, shall be liable for each offense to a penalty of \$500, to be recovered in an action of tort to his own use by the party aggrieved, or to the use of the state by the Attorney-General or the Solicitor of the county in which such violation was committed; but no such action shall be maintained unless the same is brought within two years from the date of such violation.

SEC. 29. The Legislature may alter, amend or repeal this act when the public good may require the same.

SEC. 30. This act shall take effect upon its passage.
Approved Sept. 14, 1883.

Will the Loss of the Earnings of a Passenger Car while in Shops for Repainting be Compensated for by the Value of Repairs Done it by the Usual Methods?

[Paper read at the annual convention of the Master Car-Painters' Association, by Frederick S. Ball, Foreman Painter of the Pennsylvania Railroad Car Shops at Altoona, Pa.]

In answering this question we propose to adopt the ingenious device of the Yankee who answers one question by asking several, nor do we propose to ask only, but we shall endeavor to answer the questions we propound.

First, then, does the withdrawal of a passenger-car from the road, for repairs of any kind necessary for its preservation, entail a loss of earnings to said road?

The passenger equipment is to a railroad what the machinery is to a mill or factory, a part of the earning power of the capital invested in it; and as the business of the mill or factory could not be carried on without machinery, neither can a railroad without cars in sufficient number to meet the exigencies of ordinary wear and tear, in the conduct of its utmost traffic; consequently we meet the question propounded to us for solution with the declaration that when a car needs general repairs it is unfit for continued service and is therefore no longer a tenant of the road; hence we maintain that its withdrawal entails no loss. But, lest our question fall through or lack in importance, we propose to examine the usual methods of repainting passenger cars with regard to durability and the time occupied in performing the work, and to suggest, if possible, the practicability of reducing the cost of the same to a much lower minimum than at present without any appreciable

loss to the car in general appearance or durability. In doing this it will be necessary to call your attention to statistics obtained for the most part from the experiences of the Pennsylvania Railroad, and as valuable statistics can only be gained when a passenger car is kept in the best possible condition while being put to the greatest use, we deem we have committed no offense in doing so.

The average life of a passenger car is 16 years.	
Value of passenger car when new	\$5,100.00
Estimated value at 10th year	945.03
Estimated depreciation in value, 16 years	4,154.96
Yearly average of cost of painting repairs	259.98
" " " all other repairs	146.48
" " " total repairs	558.54
Cost of painting repairs during life of car	700.00
" " " all other repairs	2,343.47
Grand total of repairs	8,856.64
According to these figures you will note that the cost in market of a Pennsylvania Railroad passenger car would be about \$5,100. Its life is estimated to be about 16 years, after which time it has but scrap value, which is about \$945.	

From this it will be seen that, notwithstanding its annual repairs, the average cost of which amounts to about \$700, it has undergone an annual depreciation of \$259; now if this \$259 be added to the cost of annual repairs (\$700) and the sum be multiplied by 16, it will be seen that the wear and tear of the car during life has been \$15,244. Now, as the painting on a passenger car is destroyed with its usefulness, you will observe that all the painting and varnishing it has received has been totally merged in its wear and tear; hence it becomes an interesting question as well as a subject for investigation as to how much the painting has contributed to the preservation of the car during these 16 years. Like painting, so painting is an art preservative, and so far-reaching in its results, when intelligently applied, that it would be impossible to say to what extent it has been the means of preserving the car, or, if neglected, to what extent the neglect has damaged it or hastened its decay. It is of course a matter of importance to all roads that work on their passenger cars should be done as speedily as possible. The average time expended in the painting of a passenger car by the system most in use, that is, lead and oil, is six weeks, which is probably the shortest time possible by this system. There are other systems lately perfected by which it is claimed a car can be painted in one-half that time. Now, as continual competition is going on between the different roads, it is requisite that the passenger equipment of each must be fully up to that of its competitors in every respect, else a loss of patronage would follow; therefore, some regard must be paid to the quality of the painting in reference to its general appearance. We do not think that a passenger car should receive the same degree of finish as a private carriage. It cannot be so well cared for, nor receive the same protection. Being unavoidably subjected to so much harder usage and greater exposure, it soon loses its beautiful gloss, however highly finished, and in a few days, or weeks at most, the pelting sparks from the engine, together with the flying dust and sand, will have abraded the carefully finished surface and destroyed its beauty, and no amount of careful washing at stated periods, by skilled labor, with soaps made according to a prescribed formula, will restore its lost surface. Now, since this is the case, as every one acquainted with the painting of passenger-cars will admit, and as at the convention of 1878 the question, "Is it any longer practical to surface in any manner for a railroad car?" was discussed, and, as we remember, the negative conceded, we, for our part, without questioning that decision, would advocate a happy mean between the two extremes for general practice—a medium system, as it were. The prime cost of painting a passenger car outside is variously estimated at from \$300 to \$600. On the Pennsylvania Railroad it is \$310.13, and if it is not properly protected will require repainting in two years in some climates, perhaps in less time. Now this, for 16 years, is of itself a considerable item which has to be added to the wear and tear, and is included in the statement before made.

To lessen this great item of expense, without risk of increase in the annual depreciation of the value of the car, and at the same time render the painting more durable and a greater protection to the wood, is the object we have in view.

The surfacing material employed in the painting of a car is composed of pigment and vehicle. This, without contributing much to its durability, may be elaborately applied or cheaply executed. Now, as its chief value is in its elasticity and the general cohesion of its particles, it follows that for durability the cheaper method is the equal of the most elaborate; hence we would urge less labor in the preparation of the surface. This point gained, we would proceed to protect the surface thus obtained in the best possible manner. Our proposition, then, is that as long as the combined pigment and vehicle is intact the painting is preserved. Now, how shall we keep it so and maintain our first proposition to lessen the general wear and tear, and the special cost of painting, thereby, perhaps, lengthening the life of the car? Let us see: It is a conceded fact that without varnish the painting on a passenger car would be of little value; it is the bulwark that shields the pigment from the influences of sun and cloud; therefore, we say keep well covered with the best and most durable varnish that can be obtained, and as the best varnish made will lose its elasticity and become porous in a short time when exposed to the weather, we think you will admit the absolute necessity of frequently revarnishing. Our country is so large and its climate so varied, that no absolute rule as to its frequency could be adopted, but it is safe to say that in the Northern states this should be done, at least once in 12 months, and in the Southern states twice. Now, as five or six days is all that is necessary for cleaning and varnishing a car, a railroad could much easier spare its cars, and more frequently for that length of time, than it could for repainting. Further, we claim that by frequent revarnishing it is no longer necessary to repaint every two years (unless by reason of other repairs, such as faulty construction, the use of unseasoned lumber or wreckage it is made necessary), once in three or four being often enough, according to climate. Having now given you the suggestions which have occurred to us in regard to the painting and the preservation of the paint on a car, we submit to you, gentlemen, for your views, and as many of you have large experience some one may have other suggestions to offer better than these.

In treating this subject, it may occur to you that we have barely touched upon some points that might have been pursued with profit, but we find the field so extensive that it is impossible to cover the ground without obtaining more statistics to enable us to pursue further investigation. Whatever we have failed to do we ask the liberty of according to you, feeling assured that we have sustained our position, that although no loss is sustained by the withdrawal of a car from service when unfit for service, yet the special cost of painting and the time the car remains unfit for service may both be greatly reduced.

The Latest Bridge over the Missouri.

The Omaha Herald gives the following description of the new bridge over the Missouri River at Blair, Neb., which

has been built by the Missouri Valley & Blair Railway & Bridge Co., and will be used by the Sioux City & Pacific road:

On the section of the river where the new bridge is located the banks are 5 to 10 or more miles apart, the country between them being the usual Missouri River bottom land. For a distance of about 50 miles the river does not strike either bluff, but wanders back and forth in the bottom lands with no fixed banks to correct its course. The proverbial instability of the Missouri River is nowhere more prominently felt than here. The commercial necessities of the case required that the bridge should be built, and the physical conditions of the situation made it necessary to give the river an artificial stability which nature had not given it. The work of controlling the river has been quite as important as the construction of the bridge and has involved a vast outlay of time and money. The first examinations were made in the winter of 1881-82, by surveys and borings, which showed that solid limestone rock existed about 50 ft. below the assumed low-water level, well calculated to sustain the piers of a bridge. A plan for the rectification of the river was decided on, and it was decided to erect a bridge 1,000 ft. long to protect the shore by rip-rap and mattress work until it should be as stable as a rocky bluff, and to close all slough channels on the east side so that the river would have no room for a width greater than that found at the stable places below. This bridge is the eleventh constructed across the Missouri River. At several others important rectification works have been required, but it is the first bridge located at a place which may be described as absolutely unstable, with no permanent shoreline on either side. This work was done successfully, though seriously interrupted at times by heavy floods, and the banks are now in such shape as to preclude any possibility of washing. On the east side 30,500 tons of rip-rap stone and 3,600 cords of brush have been used. The dyke was built of willow mattress work, wired together and heavily weighted with stone. The revetment on the west side was begun in the summer of 1882, though but little was accomplished until 1883. Up to date 59,000 tons of stone and 7,100 cords of brush have been required in this plan. The river has been held at the line selected, and the fact that the channel has been scoured out to the limestone rock proves that this protection will be permanent.

The bridge proper consists of three through spans of iron and steel resting on four masonry piers, with a short deck span at each end. The through spans are each 330 ft. long between centres of piers, and the distance from centre to centre of the east and west piers is 999 ft. The length of the permanent iron structure is 1,270 ft. The lower chords of the spans are placed 50 ft. above high water, thus giving free passage to steamboats without a draw. The four piers are built of yellow sandstone, the cut-waters of the two channel piers being of granite. Each of the four piers is founded on a timber caisson 54 ft. long and 36 ft. wide, sunk to the rock below by the plenum pneumatic process, and filled with the best Portland cement concrete. Air pressure was put on the first caisson on Nov. 22, 1882, and the last foundation was completed April 19, 1883.

The superstructure consists of three 330 ft. through spans and two short deck spans at the ends. It is proportioned to carry a train of indefinite length formed entirely of the heaviest class of locomotives now in use. These three spans contain 1,465,000 pounds of wrought iron and 880,000 pounds of steel, besides 48,000 pounds of cast iron in pedestals, etc. The deck spans are 110 ft. long, the shore ends resting on inexpensive iron cylinder piers of the Cushing pattern; each span is divided into five panels of 22 ft. each, with an addition of a panel or iron floor beyond. These deck spans contain 250,000 pounds of iron and steel. The iron and steel work was fabricated and erected by the Keystone Bridge Co., of Pittsburgh, Pennsylvania, from detailed plans prepared by the Engineer of the Missouri Valley & Blair Railway & Bridge Co. The floor beams and track stringers are of iron, and on them is laid a safety floor of heavy oak ties, placed only 6 in. apart, with heavy angle-iron guard rails, with foot walk and light hand rail on each side.

The east approach is about two miles long from its connection with the old Sioux City & Pacific track to the eastern end of the iron work. When completed it will consist entirely of an earth embankment; but to save time, the embankment, the 3,000 ft. next to the bridge have been built in the form of a temporary timber trestle. The completion of the bridge renders access easy to the clay bluffs on the west side, and the whole trestle will be filled at once to a safe height above the high water, and the whole of it will be replaced by an embankment before the life of the timber is spent.

The west approach is about 1½ miles long from the connection with the Sioux City & Pacific track near Blair to the west end of the iron work, the distance from the edge of the bluff to the river being about half a mile. There is a trestle on this approach about 1,000 ft. long over Fish Creek, the old Sioux City & Pacific track and the intermediate ground. Between this trestle and the bridge there is an embankment from 40 to 50 ft. high which has been built by steam-shovel work with clay taken from the west bluff. It was expected to have this embankment entirely completed before the opening of the bridge, but a serious settlement occurred at a place where it crossed an old slough, the total settlement being apparently as much as 30 ft., while the ground on both sides has been forced up 14 ft. Boring at the sink showed a great depth of mud and clay, though the bed of the old slough was scarcely visible on the surface. The bank has been brought to grade and has acquired a permanent stability, but the extra amount of material in this work has prevented its completion in season for the bridge, and required the building of a short piece of trestle-work at the east end of the bank. The total outlay so far has been about \$800,000, and it is estimated that \$200,000 more will cover the cost of work yet to be done.

Repairing a Suspension Bridge.

The Suspension bridge, that link between the sister cities, Pittsburgh and Allegheny, which is traveled by hundreds of thousands of people weekly, has been in such a state of commotion, owing to the repairs being made upon it, that people have complained and growled at the inconvenience occasioned, and some of the papers have even said that the directors have been spending the money in order to cut down the reserve fund. All of which is an injustice to the bridge company in this instance. The work on the bridge is under the care of Mr. F. Collingwood, an old and experienced engineer, sent out by Col. Roebeling, who built the bridge and is a large stockholder in it. This morning the writer was shown over the big green combination of iron and wood by Mr. Collingwood, who took pains to explain minutely what had been and what would be done.

It has been 24 years since the bridge was built, and in all that time the moorings of the cables have not been repaired to any extent. Col. Roebeling thought it would be well to examine the wires and see what condition they were in, and it is well that such scrutiny took place, for the bridge was in danger of being ruined by the sagging and even by the breaking of the cables. There have been many changes in

the manner of building bridges since this one was put up. These changes are improvements in every way, both as to the way in which the wires are protected and in the way they are surrounded at the moorings. The large cables, which are 7½ in. in diameter, were closely surrounded at the moorings on each end by masonry which was concreted closely around the wires. Before the cables were so surrounded, they were covered with a preparation of boiled tar. Tar was once supposed to be an admirable protector of iron, but this belief was exploded long ago, and the result in the present case illustrates how injurious it is. The tar gradually, through atmospheric influences, changed into tar water, and this water was rapidly ruining the wire. The water contained chloride, carbonate, and other salts of ammonia, which ate the iron. Some pieces of wire were dotted with little holes, like small-pox pits, where the rust had gnawed away the material, and when the wires were uncovered and a strain put upon them they snapped like straws. Although each of the ¾-in. wires should stand a strain of over 1,200 pounds they broke at 200. As soon as this state of affairs was discovered, Mr. Collingwood began to scrape the tar off and carefully overhaul each cable. Whenever a defective piece was found it was cut out and a new piece spliced in. The splicing was a delicate and difficult piece of work. It is easy enough to join the ends together, but it is not so easy to get just the right strain on the new piece. There must be no slack wires in the cable, of course, so each splice is put in with a grip machine and the amount of strain is kept uniform by delicate tests. In one large cable 175 wires had to be spliced, in another 31, in another 71, five in another and 31 in another, and three are not yet examined. It is very tedious work scraping each wire, as only a few men can work at a time. There are 600 of these wires in the big cables and 200 in the small ones, so that the amount of work can readily be seen. After the wires are scraped they are covered with a coating of linseed oil, which is allowed to dry, and a thorough application of white lead is given. Then the wires are drawn together by bands of small wire 7 in. apart and the wrapping goes on. The wrapping consists of wire 1-16 in. thick, and it takes 300 ft. of this wire to a foot of cable. A coat of ordinary white lead and coloring finishes the work.

One mistake made in building the bridge was in putting the masonry around the cables at the moorings so that they could not be examined. The masonry has been all removed and a brick tunnel built which is water tight, and is provided with iron water shedders and covered by iron plates, which can be lifted when it is necessary to repaint or repair the cables in future. Where the cables pass through the woodwork, holes have been made so that all parts of the big wire can be reached at any time. The building on the lower side of the Pittsburgh end of the bridge has been torn down and a new office of Philadelphia brick is to be built. This was rendered necessary by the fact that half of the foundations of the building rest on the bridge abutment and half on made ground. The latter half sunk so as to cause a large crack in the office wall and make it dangerous. It is exactly the same case with the toll house on the Pittsburgh side, and it will be replaced. A good deal of stone work on the pier nearest to Allegheny had to be replaced as the sandstone had decayed. The decayed stone was put in the pier in 1834, and was part of the old bridge which was enlarged and built upon when the present bridge was constructed. The nosings of the pier were also renewed. The work is being done entirely by Pittsburgh mechanics under Mr. Collingwood's direction. The cost of the repairs will not be over \$10,000 or \$15,000, and they will not be completed for a couple of months. Mr. Collingwood says that the flooring needs repairing, but the company has no seasoned wood on hand at present. He says it takes 10 per cent. yearly of the cost of a large bridge to keep it in good condition. None of the repairs were made necessary by the fire of two years ago, strangely enough. The bridge has safely supported a load of 23 tons on one wagon, but the engineers advise the directors to refuse to allow more than 12 ton loads to pass over.—Pittsburgh Telegraph, Oct. 31.

THE SCRAP HEAP.

The Station Clock.

He stood at the ticket window slowly unrolling an old-fashioned leather wallet, while a dozen impatient men stood behind him, driven to madness by the shouting of the gate-man calling their trains. After he got about a yard and a half of wallet unrolled he suddenly stopped and said to the ticket agent:

"Is that clock right?"

"No, sir," promptly replied the agent.

"Tain't!" shouted the startled passenger, stooping down and making a sudden clutch at a lean and hungry carpet-bag. "Tain't right? Well, what'n the name o' common sense do ye have it stuck up there for, then?"

"To fool people," calmly replied the agent; "that's what we're here for, to fool people and misdirect them."

"Well, by golly," said the passenger, hurriedly rolling up his wallet, "then I've missed my train. I'll report you, I will!"

"Won't do any good," replied the agent; "it's the company's orders. They pay a man \$85 a month to go around every morning to mix and muddle up all the clocks so that not one of them will be right and no two of them alike."

The passenger gasped twice or thrice, but could not say anything. The ticket seller went on:

"It's the Superintendent's idea. He is fond of fun, enjoys a joke, and it does him good to see a man prance around and hear him jaw when he buys a ticket and then finds his train has been gone two hours. It saves him the expense of going to the circus."

"Which way is the clock wrong?" the passenger asked in despairing accents, "fast or slow?"

"Don't know," replied the agent. "That's part of the fun, not to let anybody in the building know anything about the right time. All that I know is that it's about 90 minutes wrong, one way or the other."

With a hollow groan the passenger dropped his carpet bag and wallet, and made a rush for the door, upsetting every man who got in his way. In about two minutes he came back, crestfallen and meek, and took his place at the end of the line. When once more he walked to the window he said, as he named his station and bought his ticket like a sane man:

"What made you talk to me like a liar?"

"What made you ask questions like a fool?" answered the ticket man.—Burlington Hawkeye.

An Electric Railroad on Mt. Desert.

The parties who own the railroad up Green Mountain on the Island of Mt. Desert in Maine propose building a railroad for summer pleasure travel on the island from Bar Harbor to Eagle Lake, where connection will be made with the steamboat running across the lake to the terminus of the Green Mountain road. The distance is three miles. It is proposed to use an electric motor for running cars on the new road.



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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections appointments, and especially annual reports, some notice of all of which will be published.

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RAILROAD SIGNALS.

A contributor to the *London Engineer* who has been writing descriptions of some of the exhibits at the Chicago Exposition of Railway Appliances comments on the signal systems, or rather want of systems, in this country as follows:

"It is somewhat singular that the question of uniformity of signals should have received so little attention in the States, where many railways have combined to adopt standard interchangeable axles, wheels, axle boxes, etc. In this country the semaphore signal was superseding all other forms when the block system was first introduced, but the widest and wildest diversity prevails in America, and the advent of improved methods of signaling has even intensified the evil by introducing fresh varieties of spectacles, discs, diamonds, etc. Most of these signals are so small and badly placed that they can scarcely be seen when they indicate danger, and when turned edgewise to an advancing train to denote safety are practically invisible and give no positive signal. The best signaling appliances are of little use if the form of the signal itself is ambiguous or cannot be clearly distinguished, while the principle that the absence of any danger signal signifies safety has been found by experience to be faulty, and semaphore arms are now generally made to give permission to proceed by falling to an angle of 45 degrees or 55 degrees from the horizontal instead of dropping out of sight behind the signal post. It is always possible that a signal which cannot be seen may be rendered invisible by a failure of the operating mechanism and hence signals should always give positive indications of safety or danger. Our American cousins hardly seem to have paid sufficient attention to these fundamental principles of signaling, but have endeavored to further improve the block system by rendering it automatic, or, in other words, have substituted mechanical for human agency, and thus endeavored to eliminate one set of chances of error by introducing others."

If this writer had been disposed to do so, he could have found some striking illustrations in the exhibition of the "wild diversity" which prevails in the form, size and construction of the signals used here. One manufacturer of frogs, switches, etc., had the large space occupied by his exhibit enclosed with a railing supported by a dozen or more posts. Each of these was surmounted by a switch signal or target, and each one of them was of a different shape from all the rest. This was not due to the whim of the manufacturer, as his only object was to make it known that he was prepared to supply signals to suit the varied fancies of railroad officers. In the signals exhibited by companies which make their manufacture a specialty there was also very great diversity. Observation on railroads, too, indicates an entire absence of anything like uniformity in signals, and the chief purpose of each railroad officer, in charge of their construction, seems to be to design signals which shall be different from those used by other railroads. In fact, there are three problems which young engineers of permanent way in the beginning of their active careers always seem to wrestle with successively. The first is to discover some new method of calculating the

location of frogs, and then make it known through the columns of the *Railroad Gazette*; the next is to design an "improved" form of rail section, and, lastly to devise a new shape for switch targets and signals. After doing these three things they apparently feel confident that imperishable fame has been achieved.

It is hardly worth while to take the trouble to point out that diversity in signals is a great evil, and that uniformity is very much to be desired. This is generally admitted by experienced railroad managers. The important question for them is, or should be, how can uniformity be brought about?

Past experience has shown that it is impossible to secure anything like agreement among railroad officers, until it is very clearly established that the thing to be agreed upon is the best, or substantially as good as any that can be used. So long as there are apparently good reasons to indicate that some other thing may be better than that proposed for general use, so long will it be difficult or impossible to lead people scattered as widely as railroad officers are, and with such diverse interests, opinions and, maybe, prejudices, as they have to agree to the general use of either. In other words, evolution must precede uniformity. The best or equally good things must be evolved by invention, experience and the survival of the fittest. When this is once accomplished then co-operation and organization are required to bring about agreement, but the latter is usually impossible until after the evolutionary process has indicated what to do. In the adoption of standards by the Master Car-Builders' Association it is very apparent that its action was always preceded by a process of evolution. The standard height of draw-bar, 2 ft. 9 in., was established because it was found that that height was about a mean which was arrived at by the experience and practice of the members all over the country, and a few inches more or less was not a matter of much importance. When the standard axle was adopted, the dimensions of those in use varied with the fancy of each car-builder. It was apparent, though, that it mattered little which of the standards was used, provided the axles were strong enough and had sufficient bearing surface on the journal to resist the friction. The members of the Association, however, wisely recognized the tendency to increase the loads of cars, and adopted dimensions somewhat larger than those employed in the prevailing practice. The same principle may be recognized in the adoption of the other standards by the master car builders. Experience had first to solve which dimensions or forms of construction were the best, before the members of their Association would agree to recommend them. In many cases it may happen that experience will show that the advantages of our form of construction or proportion of parts is of less importance than uniformity; and in such cases there usually is, or should be, sufficient of the spirit of concession on the part of the members to lead them to relinquish their preferences for unimportant features for the sake of a general agreement.

If we recognize the principle, then, that evolution must precede uniformity, the first inquiry which should be made concerning signals is, whether it has thus far been distinctly shown which form of signals is the best. The signals referred to are those by which the movement of regular trains is governed. With reference to these, the practice in this country alone has not distinctly indicated that any one or more forms are superior to all others. The signals of this kind on nearly all lines differ from those used on other roads. But in Europe, especially in Great Britain, the superiority of the semaphore is now universally recognized, and there it has displaced nearly all other forms of main-line signals. Nearly every writer on the subject has called attention to this fact, and it has been reiterated in these columns over and over again. Probably nearly all experienced and intelligent railroad men in this country would come to the same conclusion if they visited Europe, or if they carefully studied the literature of the subject. The fact is, however, that until quite recently (and it is even doubtful whether even now) a majority of the higher officers of our railroads had no distinct idea of what a semaphore signal is. It is a curious fact, too, that the first impulse of some of them, when they are made acquainted with the merits of that form of signal, is to go to work and "improve" it. As we have stated heretofore, it would be about as reasonable for one who is studying music to attempt to improve the construction of the violin, when he begins to take lessons on that instrument, as it is for a "fresh" road-master or superintendent to try to improve semaphore signals when he first learns of the merits of that appliance. Some of the puerile attempts at "improvement" would be amusing, if they were not at the same time so disheartening. One engineer "improved" the semaphore by

raising up the arm instead of lowering it. Another made the blade of the form of a paddle—that is, the outer end was made of a circular form, the diameter of which was more than double the width of the blade between the circular part and the post. On one road the blades were made of iron, and nearly all beginners seek immortality by devising an iron signal post to be used instead of wooden ones. Some person, with a similar ambition, a few years ago, erected an iron telegraph post at the corner of Broadway and Twenty-third street in New York. It is made of several vertical members of angle-iron, incircled with rings or bands a few feet apart. Some time ago an ill-favored wind or other cause strained this post, and it now stands with its top bent over as though it was mortified at the folly of its author. The difficulty was that the designer of it was ignorant of the need in such structures of diagonal members, and none were used, and the post therefore had very little strength to resist lateral strain. As a matter of fact, even in England, where wood is much more costly than iron, it is found that, counting the endurance, wood is a more economical material for such posts than iron. Here, where wood is abundant and comparatively cheap, it seems as though the argument in favor of its use was very much stronger. In fact, a good stick of southern pine, tapered at its base, and well anchored in the ground by a cross-frame at its base, is a structure which, for simplicity, durability and efficiency, is hard to beat. Probably if some better material for posts existed, the trunks of trees would not be made of wood.

There seems to be some danger that in this country semaphore signals may be improved to death. Those who are afflicted with too much ingenuity attack the mechanism for working them, the arrangement of lamps, and in fact every detail of construction is exposed to the meddlesomeness of over-inventive. Now, the fact is that semaphores were used more than two hundred years ago for visual telegraphic communication, and they continued to be used for that purpose until they were displaced by the electric telegraph. They were introduced on British railroads more than forty years ago, and since then have been subjected to a process of evolution and to some of the ablest engineers and many of the most experienced railroad managers in the world. They have been multiplied so that there are now thousands of them in use. Their defeats have been investigated after many railroad accidents, and they have been constantly subjected to searching criticism by the ablest experts in Great Britain. Now it would, of course, be the greatest folly to say that semaphore signals have attained perfection, and are incapable of improvement; but, it may be asked, what probability is there that a person who has never seen semaphore signals in use, who knows very little about the way in which they fulfill their special functions, who has had no opportunity of seeing the accidents to which they are exposed, or the way that their indications may be misconstrued—what probability is there that such a person will make an improvement which would not, long ago, have suggested itself to some of the hundreds or thousands of people who have been observing their action in a climate in which it is especially difficult for signals to fulfill their purpose, and on railroads where traffic is very much greater than that of most of our American lines? While nothing could be farther from our purpose than to interpose any obstacles in the way of development of ingenuity or invention, nevertheless there is a great deal of ignorant invention, and a railroad manager who will regard any proposed improvement of semaphore signals as belonging to that class of inventions will run little danger of being wrong.

So little was the construction of ordinary semaphore signals, as used on European roads, known in this country that a few years ago we procured from Messrs. Saxby & Farmer, of London, drawings of them which showed the latest form of construction then used. These drawings were engraved, and were published in the *Railroad Gazette* of Oct. 4, 1878. Probably all experienced designers of similar mechanism will be struck with the simplicity, the effectiveness and the beauty, it may be called, of the mechanism employed. Every part was made so as to perform its function in the simplest and most direct way. The designs are the result of an exercise of a very high degree of mechanical knowledge, skill and experience.

As before stated, semaphore signals have been almost universally adopted in British railroads, and are very generally used on the continent. The process of evolution has therefore already taken place, and it seems only necessary for our railroad managers and those who control the signals to become acquainted with what has been done on foreign roads to be prepared to adopt that form of signal as the standard to govern the movements of all trains.

Through the introduction of the interlocking system in this country semaphores have become more generally known here during the past few years than ever before, and the New York, West Shore & Buffalo road has just adopted that form of signal for its whole line.

It would seem then as though all that is essential to secure the adoption of or at least to establish a standard system of signals, would be to bring about a meeting of the representatives of the railroads of the country for the purpose of discussing and taking action on this important subject. The difficulty would be, however, that in all probability the majority of the representatives who would attend such a meeting would be more or less ignorant of what has been done abroad and of the extent to which the process of evolution has there established the superiority of semaphore signals. They might not, therefore, be disposed to adopt what the most abundant experience has shown to be the best kind of signal. If the decision were left to a board of American experts, who are well acquainted with European practice in signalling, there would be little doubt about their decision. It is to make what has been done across the water better known here that this article has been written, in anticipation that the question of the adoption of some standard system of signals must, before long, come up in this country for consideration and probably action.

Talk of a New Chicago-St. Paul Line.

A new line to St. Paul is reported to be under survey along the east side of the Mississippi from Dubuque to St. Paul. Apparently all that is known of the enterprise is that some one is making a survey of such a line, and it has been surmised that some railroad east of Dubuque is behind the scheme. The first surmise published was that the Illinois Central was probably responsible for it; but as the Illinois Central owns but a comparatively small part (81 miles) of the line over which its cars run from Chicago to Dubuque, this seemed improbable. The next surmise was that the Chicago, Burlington & Quincy, the owner of the other 120 miles, is intending to reach St. Paul, which is perhaps more probable. Yet, it will be remembered that but a few years ago this company made no effort to save for itself the "River roads," which had been built with the intention that they should be feeders of the Burlington road, and gave it a complete line as far north as La Crosse, within 130 miles of St. Paul. It did not make such an effort when these roads were reorganized after their failure to pay interest; nor, when the Northwestern and the Milwaukee & St. Paul were competitors for the purchase of the reorganized and consolidated road in 1880, when St. Paul traffic had developed greatly, did the Burlington manifest the slightest indication to get possession of it. There has been a farther "boom" in the St. Paul and Minneapolis traffic since then, certainly, though none that could not have been foreseen then; but the place lies far beyond the field in which the Burlington has worked heretofore, and a line to it would complicate its relations with some of its neighbors. But since it declined an alliance with the River roads, its next neighbor on the south has secured a St. Paul line, and is understood to have a very handsome traffic on it, though it is quite circuitous. At the same time one of the old lines between Chicago and St. Paul has completed a new road to Council Bluffs, and now three of the Burlington's four competitors for the Omaha business have lines to St. Paul as well. It is possible that if these, or any of them, were unreasonable in their competition for the Omaha and Iowa traffic, they could be brought to reason more easily if the Burlington had some power over the important business of these rivals at St. Paul. Thus there may now be an inducement for the Burlington to complete a St. Paul line which did not exist even a few years ago, when only one of its associates in the Iowa Trunk Lines Association had a St. Paul line. Not that this alone would justify the construction of two or three hundred miles of road, but that it might suffice to turn the balance in favor of a project which otherwise might not be undertaken.

It is noticeable that there has been no railroad constructed to connect with the Northern Pacific, as there was to connect with the Union Pacific. When the latter was completed, the Chicago & Northwestern alone gave it an outlet to the East, but the Rock Island and the Burlington were hurrying forward to connect with it, and there were numerous projects never carried through to give many mouths to that then extremely slim stream of traffic.

But Omaha in 1869 was very different from St. Paul in 1883, or even in 1873, when the Northern Pacific was completed to the Missouri River. There has been for some time a considerable railroad system west of St. Paul, and the traffic which it brings there is doubtless several times as great as all that the new

part of the Northern Pacific will furnish for several years to come. Thus it required and obtained eastern outlets entirely independent of the Northern Pacific, and has for many years had two, and for a few years has supported them well, while giving a large business to the new comer, and sending enough north to Lake Superior to give good earnings for two years past to the St. Paul & Duluth road. That the completion of the Northern Pacific has attracted no new line from the East is not so noticeable when we remember that it already had three Eastern lines, and that a large part of the Northern Pacific itself was not new but fully ten years old.

A line up the east bank of the Mississippi seems superfluous for local traffic. The river itself is an outlet for the country on both sides, except in winter, and there is a railroad all the way from Clinton to St. Paul along the west bank, the southern 160 miles of which had not been able to secure more than a very light traffic down to the time of the sale of the Milwaukee & St. Paul—earning about \$2,700 gross per mile when it had been open six years, and not very much more probably in the year before it was purchased (1880), when with a mileage of branches equal to that of the main line (but with probably much lighter earnings), the average earnings per mile were \$2,450. There is a more populous and productive country on the west side than on the east side of the river north of Dubuque. The counties on the east side, having altogether an area equal to 172 townships (six miles square), by the census of 1880 had 207,582 inhabitants, or an average of 1,209 per township; those on the west side, having an aggregate area equal to but 135 townships, had 200,403 inhabitants, or 1,484 per township. The west side, however, is, and was before the River road was built, better supplied with railroads than the east side. There is now, however, a line not far back from the river most of the distance from Galena to Winona on the east side.

It would seem strange if there should be river roads on both banks of the upper Mississippi below St. Paul almost as soon as the Hudson had a road on both banks of its mighty stream, which has so long been populated. But the country along the Hudson does not and never did afford so heavy a traffic as the country on the upper Mississippi, with the vast expanse of fertile land west of it, and the lumber coming from the tributary streams on the east side. Further, the Hudson is immensely superior to the upper Mississippi as a means of communication—is navigable many more days in the year, and by craft which can give better and cheaper accommodations. Still it is not easy to see how an east-side river road between Galena or Dunleith and St. Paul could get much support from local traffic. The distance is about 250 miles. All the large river towns on both sides now have stations of the Milwaukee & St. Paul road, which gives it a great advantage for travel and shipments from place to place over a road having stations only on one side.

If the Illinois Central wished to reach St. Paul, it could do so most easily by extending its Cedar Falls and Minnesota Branch, long in operation to the Minnesota line, where it connects with the Milwaukee & St. Paul, whose line thence to St. Paul is but 113 miles long. This connection, of course, does not enable the Illinois Central to get a share of the Chicago-St. Paul traffic. The distance between Dubuque and St. Paul by this route is 386 miles, against 244 by the existing River road. It would make a much shorter line from Chicago to St. Paul than the Rock Island route. The Illinois Central works 352 miles of the total 487 in the line, but it owns only 79 of them, and probably the major part of the net earnings of through traffic attracted over the line would go to the lessors of the Iowa lines under the terms of the lease. On this account the Illinois Central Company is probably less anxious than it otherwise might be to expend its own money to add to the traffic of its Iowa lines. Yet it would be quite as unlikely, one might think, to build 250 miles of new road for the sake of increasing the traffic of the 79 miles between Dunleith and Forrester.

The cheapest way apparently to make a new line which should serve the three parties concerned would be for the Chicago, Burlington & Quincy, the Illinois Central, and the Iowa companies whose lines the Illinois Central leases, to unite in extending the Cedar Falls & Minnesota line the 115 miles or so to St. Paul. A new line might be built parallel to and east of the Milwaukee & St. Paul's line from Austin to St. Paul, as the Minneapolis & St. Louis was built parallel to and west of it. It might not find local traffic enough to make it rich, but perhaps as much as a new river line would find, and it would have the advantage of requiring but half as much new road, and that probably cheaper to build, not having to cross so many streams, and being in smoother coun-

try. It would be a longer through line, it is true, but that does not always seem to be a disadvantage, and its length would at least not prevent it from causing the other Chicago-St. Paul lines a vast deal of trouble; and as things go now a great company seems compelled, at times, to build a hundred miles or so of road that does not look likely to earn the whole of the interest on its cost, in order to have on hand an effective weapon of offense and defense. This weapon may never be used in war, to be sure, but, like a standing army, it serves to make warlike neighbors, who otherwise might encroach upon a rival's rights and privileges, treat him with proper consideration. In a barbarous society the burly fellow who is "handy with his weapons" and is known to carry them always is less likely to be robbed than a person who has nothing but a stick, and can't handle that very well. In the matter of competition of railroads we have hardly passed the barbarous stage yet, and such considerations as we have mentioned often have no little weight.

That they have in this case, however, we have no reason to believe. That is, we know of no trouble among the four or five railroads mentioned which would be likely to lead the Burlington or any other company seriously to contemplate building a line to St. Paul in order to secure additional power over some competitor or competitors. Indeed, we have no reason to suppose that the survey mentioned is likely to result in any new road to St. Paul. Surveys are much more numerous than new railroads and are often made with very little expectation that a road will be built over the line surveyed. The people on the line are always ready with explanations, however, when the engineers have none to give (and not unfrequently know little more than their questioners). Their surmises in this case were, first, that the Illinois Central, and next that the Chicago, Burlington & Quincy, was seeking a line to St. Paul. Though the surmise is not worth much attention, it seemed worth the while to see what interest these companies could have in a line to St. Paul, how they might secure one, and what the effect might be.

Chicago, Burlington & Quincy Earnings in September.

Chicago, Burlington & Quincy earnings in the month of September were this year no less than \$722,765 (33 per cent.) more than last year; the working expenses increased \$375,050 (39.3 per cent.); so that there was an increase of \$347,715, or 28.2 per cent., in net earnings—a very great gain indeed. The increase has been made with a comparatively trifling addition to the mileage of road worked, and it makes the earnings much the largest the company has ever had in a single month.

The increase in earnings over the corresponding week of last year, however, is hardly as remarkable as the increase over previous months of this year. For four months these have been:

June.	July.	August.	September.
\$1,937,916	\$1,824,705	\$2,485,123	\$2,902,165

while for the five months ending with May they were at the average rate of \$1,893,457 per month. That within two months the earnings should have increased nearly 60 per cent., seems marvelous. Last year when there were good crops in Kansas and Nebraska, following miserable ones, the company's earnings in September were but \$361,695 (23½ per cent.) more than in July; this year they are \$1,084,460 (59½ per cent.) more. The larger part of the gain, it will be seen, was in August, but the gain in September over August was great also.

For eleven successive years the mileage, the gross and net earnings and working expenses of the company in the month of September have been:

	Miles.	Gross earnings.	Expenses.	Net earnings.
1873.....	1,368	\$1,254,186	\$445,413	\$708,773
1874.....	1,368	1,091,644	375,453	516,191
1875.....	1,342	1,213,222	532,887	680,335
1876.....	1,670	1,242,123	566,430	675,693
1877.....	1,653	1,363,310	608,569	754,801
1878.....	1,733	1,382,123	672,469	709,654
1879.....	2,597	1,484,316	696,378	787,938
1880.....	2,712	1,862,284	837,452	1,024,832
1881.....	3,108	2,262,981	1,017,328	1,245,653
1882.....	3,230	2,186,400	954,563	1,231,837
1883.....	3,240	2,909,165	1,329,613	1,579,552

From this it appears that never before has there been an increase in earnings over the previous September anything like as great as the one that has been made this year, and the same is true of net earnings.

For the nine months ending with September the earnings and expenses this year and last were:

	1883.	1882.	Increase.	P. c.
Gross earnings.....	\$18,634,197	\$15,053,879	\$3,580,318	23.8
Expenses.....	9,591,548	8,069,752	1,521,796	18.8
Net earnings.....	\$9,042,649	\$6,984,127	\$2,058,522	29.5

This increase in net earnings is about \$950,000 more than the addition of \$1,100,000 to the interest charges and the amount required to pay interest, for the whole year, on the additions to the funded debt, and 8 per cent. dividends on the increase in capital stock, which \$950,000 is about 1½ per cent. on the stock.

For six successive years the gross and net earnings and

working expenses of the nine months, ending with September, have been:

	Gross earnings.	Net earnings.
1876.....	\$8,791,746	\$4,040,125
1877.....	9,046,495	4,983,121
1878.....	10,378,546	5,509,841
1879.....	10,303,937	5,434,744
1880.....	15,129,853	7,042,726
1881.....	15,423,831	7,891,905
1882.....	15,053,879	8,069,752
1883.....	18,634,197	9,591,548

After the acquirement of the Nebraska system at the beginning of 1879 there was comparatively little change in the gross earnings for three successive years, with a continuous and important decrease in net earnings—\$555,000 from 1880 to 1881, and \$548,000 from 1881 to 1882. But this year the increase, \$2,053,000, not only makes up for these losses, but leaves the net earnings nearly a million greater than in any other year.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Atchison, Topeka & Santa Fe.—A branch of this company's *Southern Kansas* line is completed from Chanute, Kan., eastward to Walnut, 24 miles.

Chicago & Northwestern.—The *Correctionville Branch* is extended from Correctionville, Ia., westward to Kingsley, 13 miles.

Danville & New River.—Extended from Martinsville, Va., west to Spencer, 13 miles. Gauge, 3 ft.

Flint & Pere Marquette.—The *Harrison Branch* is extended northward to Houghton Lake, Mich., 15½ miles.

Gettysburg & Harrisburg.—Track laid from Hunter's Run, Pa., southward 6 miles.

Ohio River.—Track laid from Parkersburg, W. Va., northward 14 miles.

Valley of Virginia.—Extended southward to Lexington, Va., 5½ miles.

This is a total of 91 miles of new railroad, making 5,279 miles thus far this year. The total new track reported in our columns to the corresponding date for 12 years past has been as follows:

	Miles.		Miles.
1883.....	5,279	1877.....	1,867
1882.....	8,731	1876.....	1,931
1881.....	6,008	1875.....	1,128
1880.....	4,946	1874.....	1,594
1879.....	2,987	1873.....	3,288
1878.....	1,777	1872.....	6,106

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

THE PENNSYLVANIA RAILROAD DIVIDEND declared last week is 4½ per cent. for the half-year, and stockholders have the option of taking 2 per cent. of it in stock. As the stock ex-dividend sells about 56½ (for \$50 shares), of course the option will be exercised and the dividend amounts to 4¾ per cent. in cash. By this dividend the capital stock of the company will be increased \$1,808,387, and becomes \$92,227,775. This addition to the stock represents cash expended upon the property, costly additions to and improvements of which have been made from year to year, and are still in progress. The policy of raising the capital for these additions by adding to the stock instead of the funded debt is a conservative one. To some stockholders it may seem better that it should be raised by bonds, on which 4½ per cent. or less would have to be paid, instead of the 8 per cent. dividends or more that are expected on the stock. If the stock had to be placed on the open market there would be a good deal in this; but as the stockholders themselves get the additions to the stock, it is to them and not to outsiders that the high interest will be paid. It is true that some holders may not be able to keep the stock issued for the dividend, because they require the whole of their income for other purposes and cannot invest part of it. But this is not sufficient reason for expanding unduly the funded debt. There have been years in the past and there may be others in the future when it will be of great importance to the company to have low interest charges—when a great depreciation in the market price of the stock may be prevented thereby. They should not forget that this stock, which now sells at 113 per cent. of its par value, only about five years ago brought only 60. It is by keeping down the fixed charges that the company insures against such a depreciation in the future. A very large reduction in profits may now occur with no worse result than some reduction in the rate of dividend, and not such a reduction as after 1876, when after paying 8 per cent. for two years and 10 per cent. for sixteen consecutive years previously, the dividend was reduced to 4½ per cent. in 1877, 2 per cent. in 1878, and 4 per cent. in 1879. Since 1879 the stock has made large returns to the holders—7 per cent. in cash in 1880, 8 per cent. in 1881, and 8½ per cent. in 1882 and 1883, besides privileges for subscriptions to new stock of very considerable value.

The new work now going on is, to a considerable extent, defensive in its character—that is, some of the new lines will simply enable it to retain traffic which has heretofore been brought it by other roads (the Reading chiefly) which have formed or are forming new alliances. That great mine of traffic, the Pittsburgh and Connellsville coke shipments to the West, which the Pennsylvania not long ago had pretty much to itself, it now has to divide with the Vanderbilt lines and the Baltimore & Ohio, both of which have recently been placed in position to command a larger share of it. The New York Central and the Reading will soon compete for the heavy traffic in bituminous coal from the Clearfield District, and the South Pennsylvania, at some later day, will give another line from New York and Philadelphia to Pittsburgh. There has probably been no other trunk line

which has had its local traffic so much to itself as the Pennsylvania, west of Harrisburg at least, and this has been as not inconsiderable advantage. It is true that the South Pennsylvania, from Harrisburg to Pittsburgh, will not compete for this traffic at many points, and that it must be a considerable time before it can compete at all; but with the main line once completed, it is probable that the new road will put out branches, as nearly all main lines are compelled to do, and these may be more troublesome than the main line.

THE NORTHWESTERN GRAIN RECEIPTS, which since the first week of September had been decreasing, suffered no further decrease from the third to the fourth week of October, and are still unusually large for the season, though so much less than in September. The weekly average receipts in September were 8,868,906 bushels; in October, 6,958,344 bushels. In each of the last two weeks of October they were about 6,250,000. The shipments of these markets also continue large, especially the rail shipments; but the Atlantic receipts are comparatively very small, showing, as the movement for two or three years has done, that the Western grain is absorbed to an unusual extent by the interior towns of the East. The difference between the receipts and the shipments of the Northwestern markets for the ten months ending with October has not varied greatly for the past four years.

The amounts have been:

	1880.	1881.	1882.	1883.
Receipts.....	248,992,000	213,364,000	176,150,000	226,434,000
Shipments.....	210,164,000	177,985,000	140,547,000	187,520,000

Excess of rec'ts 38,828,000 35,379,000 35,583,000 41,914,000

But the difference between the Northwestern shipments and the Atlantic receipts has followed a very different course, to wit:

	1880.	1881.	1882.	1883.
N. W. shipm'ts	210,164,000	177,985,000	140,547,000	187,520,000
Atlantic rec'ts..	257,508,000	200,758,000	126,396,000	163,135,000

Excess of At-
lantic receipts 47,344,000 22,773,000

Excess of N. W.
shipments.... 14,151,000 24,385,000

This year, though the Northwestern shipments have been 9½ millions more than in 1881, the Atlantic receipts have been 37½ millions less, and compared with 1880 there is a decrease of 94 millions in Atlantic receipts, though the decrease in Northwestern shipments has been but 23 millions.

It is possible that this change may not be chiefly due to an increase of Eastern consumption, but also partly to a decrease in the shipment of Western interior points by routes which do not pass through any of the Western markets that report. Most of the shipments which are made from points east of St. Louis, Peoria and Chicago and south of the lakes by the lines of the Pennsylvania and the Baltimore & Ohio are such; they do not pass through any reporting market, there being none east of them except lake ports. A decrease of these shipments might have been expected in 1882, when the crops in this district and just west of it were even smaller than in other parts of the country, and a large part of what they had to spare went south and not east; but in 1882 this district had an immense wheat crop, and a better corn crop perhaps than the country further north, which should have afforded large and not small shipments, especially as the hog crop was small, and less corn than usual was consumed in this way. Yet we see that this year the excess of Northwestern shipments increased instead of diminishing.

MEXICAN CENTRAL EARNINGS for the nine months of this year ending with September are reported to have been \$1,204,402 on the Southern and \$204,134 on the Northern Division, exclusive of earnings on materials carried for itself. Over 300 miles of the Southern Division were in operation at the beginning of the year, and counting this alone the earnings per mile for the nine months were \$3,900 or \$433 per month—not at all bad for a new road. The earnings are in silver, however, worth 15 per cent. less than our currency, in which the earnings per mile would be \$368. This part of the road extends through a pretty thickly peopled country, the city of Mexico having about 250,000 inhabitants; Queretaro, 153 miles northwest, 50,000; Guanajuato, 253 miles from Mexico (on a branch), 68,000; Leon, 259 miles, 100,000; Lagos, 295 miles, 50,000. This is a fine row of towns, which, to say nothing of the smaller places, ought to afford a handsome traffic to their sole means of transportation.

The Northern Division passes through the immense and barren state of Chihuahua, which with about 80,000 square miles has about 180,000 inhabitants, while its chief town, before the opening of the railroad, had 12,000. Of this, about 225 miles have been open throughout the year, and about as much more has been opened since. Counting the former only (and the part south of Chihuahua cannot have had much to carry yet, except material for construction), the earnings per mile of this division were \$910 per mile, and at the rate of \$101 per month. This, of course, can hardly pay expenses, let alone interest; but little could be expected of this part of the road until it meets the Southern Division—and not a great deal then, we imagine.

An unfavorable feature of Mexican Central earnings is that they have not increased from month to month.

From Mexico north 118 miles the road was open throughout 1882, and among all these large towns there has been time to develop a little traffic. But the earnings of the Southern Division, in successive months, have been:

	January.....	June.....	July.....	August.....	September.....
.....	\$147,101	\$135,574	86,768	128,167	125,525
.....	135,862				
.....	151,286				
.....	160,427				
.....	133,683				

For the first four months the average earnings per month

were \$148,370; for the last four, \$119,009, or nearly 20 per cent. less, and at the rate of but \$385 silver or \$328 gold per mile per month. There are plenty of roads in this country, especially in the South, that survive on such earnings, and the road is still in its infancy.

THE CENTRAL OF NEW JERSEY LEASE, according to returns of the earnings, expenses and rental recently published, has so far proved profitable to the Reading. For the four months from June to September, inclusive, the figures are given as follows:

	June.	July.	Sept.	Oct.
Gross earnings...	\$1,012,634	\$1,032,840	\$1,256,335	\$1,170,291
Expenses.....	561,285	534,316	565,211	549,533
Net earnings.....	451,349	498,524	691,124	620,758
Rental.....	424,936	418,173	452,043	528,651
Profit.....	\$26,413	\$80,351	\$239,081	\$92,087

By the terms of the lease dividends on the Central stock were not to begin to accrue until September. They are to be at the rate of 6 per cent., amounting to \$1,113,000 per year or \$92,750 per month. This accounts for the large increase of rental in that month. For the four months it appears that net earnings exceeded the rental by \$437,932; but if the dividends had accrued in the first three months as well as in September the profit would have been but about \$160,000.

The Central's average gross earnings per month were \$910,633 in 1881 and \$942,691 in 1882, against \$1,118,034 in the four months of this year reported above. Its working expenses were 56.3 per cent. of the earnings in 1881 and 55 per cent. in 1882, against 49.4 per cent. in the four months this year. The average expense per month were \$512,733 in 1881 and \$513,435 in 1882, against \$552,573 this year. Thus the increase over last year of \$175,334 in gross earnings per month was made with an increase of but \$34,138 in expenses, showing an unusual saving.

This year, it must be remembered, the production and shipments of anthracite coal have been the largest ever known—9½ per cent. more than last year, while last year's production was more than that of any previous year. The Central of New Jersey carried about 16 per cent. of the whole production—or did last year. Since the lease this year its shipments and those of the Reading are given together.

PACIFIC COAST THROUGH FREIGHT SHIPMENTS EASTWARD in September were the largest reported for any month this year, amounting to 20,175 tons, of which 9,929 tons, or 49 per cent., went over the Central, and 10,246 tons, or 51 per cent., over the Southern Pacific line. The shipments for the month made an average of 673 tons, or about 67 small car-loads daily. For the nine months ending with September the total shipments were 105,420 tons, of which the Central Pacific carried 56 and the Southern Pacific 44 per cent. Thus the total shipments for the nine months made up an average traffic of 385 tons a day, of which about 215 tons went over the Central and 170 tons over the Southern line, furnishing enough to make up a daily train for each line, but not a heavy train for either.

But four items of freight furnished over 10,000 tons each,—sugar, of which 13,014 tons were carried; wool, 10,640 tons; canned salmon, 10,559 tons and other canned goods, 10,418 tons. These articles were followed by ripe fruit with 9,036 tons, tea with 8,392 tons and wine with 6,374 tons. Wheat appears for the first time this year in September, when 2,063 tons are reported; previously this year only one car-load had been shipped. The canned salmon, which was the third item of freight in amount and formed about 10 per cent. of all the shipments, is very likely to go by the Northern Pacific hereafter, as nearly all of it comes from the canneries along the Columbia River.

About three-fourths of all the shipments are the products of the agriculture and the fisheries of the Pacific Coast, the exceptions being chiefly the sugar, which is imported from the Hawaiian Islands, and the tea, rice and silk, of which latter article 910 tons are reported—the most valuable of all the freight, if not the greatest in bulk.

As compared with the corresponding period of last year the total shipments show a decrease of 21,403 tons, or 17 per cent. This is due partly to very light shipments of barley this year, and partly to the experimental shipments of wheat and flour made over the Southern Pacific in the early months of 1882, which were not continued.

CHICAGO RAIL SHIPMENTS EASTWARD for the week ending Nov. 3, by the incomplete report of through and local shipments of flour, grain and provisions, were in the aggregate 45,005 tons, against 31,055 tons in the corresponding week of last year, and 42,449 tons in the preceding week of this year. The percentages, which may differ materially from the actual percentages of the through traffic pooled, show the Chicago & Atlantic to have carried 10.8 per cent. of the whole, against 4.5 the week before, the Chicago, St. Louis & Pittsburgh 13.1 against 11.6, the Chicago & Grand Trunk 7 against 8, the Michigan Central 20 against 24.3, the Lake Shore 16.8 against 15.9, the Nickel Plate 11.3 against 10.8, the Fort Wayne 13.8 against 15.9, and the Baltimore & Ohio 7.5 against 9. Thus the three Vanderbilt roads together carried 48.1 per cent. of the whole, against 51 the previous week (and 43½ in the pool); and the two Pennsylvania roads carried 28.9 per cent. of the whole, against 27.5 the week before and 27½ per cent. in the pool.

The shipments of the last week were very large. They usually become so by November, even when they have been light previously during the fall. After this week lake shipments from Chicago will not be likely to reach New York

by canal, and will probably be consigned by rail to points east of Buffalo or to Buffalo elevators for storage. Lake insurance was advanced materially Nov. 1, and both these facts encourage shipments by rail rather than by lake. In most years the pressure has been such that rates have been advanced in November if not sooner. Last year, however, no advance over the summer rate was made until Dec. 1, and unless the shipments become larger than they have been heretofore, one will hardly be made earlier this year. The fact that there are more roads open will prevent a pressure of traffic from the same amount of total shipments as in previous years.

THE GREEN BAY, WINONA & ST. PAUL RAILROAD appears to be one of the least valuable railroad properties in the country. For the year ending with June it reports its earnings on its 220 miles of road to have been \$405,931 gross and \$31,956 net, or at the rate of \$1,845 gross and \$372½ net per mile of road—the latter enough to pay 6 per cent. on a capital of \$6,200 per mile—which even a Wisconsin granger can hardly call excessive. And this is not a new railroad which has not had time yet to develop a traffic. It was completed nearly ten years ago, and both ends are at old towns. There was talk when it was built of diverting the Minnesota and Dakota wheat and flour over it from Chicago and Milwaukee to Green Bay, but it has persistently refused to be so diverted, and the earnings tell pretty plainly what sort of a local traffic there is on the line.

THE SCRAP HEAP.

Locomotive Building.

The Schenectady Locomotive Works in Schenectady, N. Y., have recently completed 15 consolidation engines, with 20 by 24-in. cylinders, for the Fall Brook Coal Co.'s roads. The New York Central & Hudson River shops at West Albany, N. Y., have lately completed a new passenger engine with 17 by 24-in. cylinders and 66-in. drivers. The Baldwin Locomotive Works in Philadelphia are completing an order for six ten-wheel freight engines for the Buffalo, New York & Philadelphia road. The Brooks Locomotive Works in Dunkirk, N. Y., which have been closed for several weeks for the purpose of making repairs and taking stock, resumed work a short time since, and now have about 700 men at work.

Car Notes.

The New York & New England road has just received two new and very handsome passenger cars, which are fitted with the new Forney patent car seat. The Youngstown Car Works, in Youngstown, O., are building 300 freight cars for the Pittsburgh, Cleveland & Toledo road, and 50 for the Bellaire, Zanesville & Cincinnati. The Jones Car Manufacturing Co., in Schenectady, N. Y., has recently completed 14 passenger cars for the Louisville, New Orleans & Texas road, and 10 for the Chicago, St. Paul, Minneapolis & Omaha. There are 20 passenger cars for the Savannah, Florida & Western road, and five Wagner and sleeping cars in the shops, besides other orders. The Jackson & Sharp Co., in Wilmington, Del., has the contract to build 25 passenger cars for the new Pittsburgh, Cleveland & Toledo road.

Iron Notes.

The rolling mill of the Kittanning Iron Co., at Kittanning, Pa., has been started up full double turn. The St. Louis Malleable Iron Co. is crowded with orders and is running its works in St. Louis to their full capacity. The Saucen Iron Works at Hellertown, Pa., have, it is said, been sold to a new corporation, which will add a rolling mill to the furnace. The sheet and plate mills of the Laclede Rolling Mill in St. Louis are running, but the other departments have not yet been started up. Truesdale Furnace near Steubenville, O., was sold at sheriff's sale Oct. 29, and bought in for \$25,333 by the trustees. The Joliet Steel Co. in Joliet, Ill., is running its rail mill on a large order for steel rails for the Chicago, Burlington & Quincy road. Citico Furnace, near Chattanooga, Tenn., is nearly finished. It will have all the latest improvements and appointments. It has a cast-house 140 ft. by 50; a stack-house 200 by 100; three Whitwell stoves, latest style, 18 ft. in diameter, 60 ft. high; two engines, 84 in. in diameter, 4 ft. stroke, weighing 80 tons, capable of blowing 25,000 cubic feet of air per minute; double hoist, 98 ft. high, supplied with one of Otis Bros.' new pattern engines and cages; chimney stack, 160 ft. high, 7 ft. 6 in. in the clear. The furnace stack itself is 79 ft. high. The steam will be furnished by twelve 46-in. boilers, 32 ft. long, grouped into four batteries of three boilers each. The Virginias for October says: "Victoria Furnace of the Iron & Steel Works Association of Virginia, near Goshen, Va., on Chesapeake & Ohio road, made 3,100 tons of pig iron in October; the largest day's work was 130 tons; its output this year to Nov. 1 has been about 16,000 tons. It obtained 49.9 per cent. of iron yield from the ores of its mines, in the furnace, during September. It is now using exclusively coke from the Hawks Nest ovens."

Manufacturing Notes.

The Baldwin Locomotive Works have ordered a second duplex boring machine from the Newton Machine Tool Works in Philadelphia. The first machine of this kind was built for the Baldwin Works some four months since. At the ship-yard of Cramp & Sons in Philadelphia there is nearly completed a new steamship for the Pacific Improvement Co. The ship is 350 ft. long, 42 ft. beam and 29 ft. 3 in. depth of hold, and will have compound engines of 2,000 horse-power. Cramp & Sons have lately closed a contract with the Morgan Steamship Co. for the construction of three new iron freight steamships for service between New York and New Orleans. They will each be 350 ft. long, 42 ft. beam and 32 ft. depth of hold, with a capacity for 9,000 bales of cotton. The vessels will have four masts and will be schooner rigged. The engines will be of the compound surface-condensing class; the boilers will be of steel, and they will also be furnished with steam-steering gear and steam winches. The vessels will cost \$350,000 each, and will be completed in 13 months. The Railway Speed Recorder Co. in Kent, O., has recently completed an addition to its works, which are very busy filling orders for the New York, Lake Erie & Western, the Delaware, Lackawanna & Western, the St. Paul, Minneapolis & Manitoba and other roads. The paint used on the iron-work of the new bridge over

the Niagara River is Elliott's Asphaltum paint, made by the National Paint Works in Williamsport, Pa. This paint is in use on many railroads and by several large bridge builders.

The Rail Market.

Steel Rails.—Some small sales are reported at previous quotations, \$37 to \$38 per ton at mill. A good deal of inquiry is reported, and a more active market. It had been said that the mills would stand out for \$37 per ton at least, but it is announced that the Lackawanna Coal & Iron Co. has taken orders for 30,000 tons, winter delivery, at \$35. This company's Scranton mills are very favorably placed for cheap production, and the announcement is taken to mean that the better located mills have decided to take business on the best terms they can get, leaving the others to look out for themselves.

Rail Fastenings.—Quotations continue nominally unchanged at \$2.60 per 100 lbs. in Pittsburgh for spikes; \$3 to \$3.25 per 100 lbs. for track-bolts, and 1.9 to 2 cents per pound for splice-bars. The demand is reported light, however, and there is a tendency to lower prices.

Old Rails.—There is more demand for old iron rails, and several sales are reported at \$23 to \$24 per ton in Philadelphia for tees, early delivery.

An Old Story Revived.

On one of the Northern trains recently was an old lady who evidently had never before made a railroad journey. After looking about her some time in curiosity her eyes alighted on the bell-line, and she asked the water boy, who happened to be passing at the time, what it was for. "That, marm," said the boy, with a wicked twinkle in his eye, "is to ring the bell when you want anything to eat," and passed on. Shortly after the old lady got down the family umbrella and reaching up to the bell-line gave it a vigorous pull. Of course, the brakes were applied, the windows thrown up, questions asked, etc., the old lady sitting calmly through the confusion. Presently the conductor came rushing into the car, exclaiming: "Who pulled that bell?" "I did," replied the old lady, meekly. "Well, what do you want?" snapped the official, impatiently. "Well," said the old lady, meditatively, "you may bring me some hash."—*Boston Post.*

How Far Can a Railroad Train Be Heard.

The Monticello (N. Y.) *Watchman* says that people in that village frequently hear the noise of the Erie Railroad trains as they climb the steep grade east of Port Jervis. The distance in an air line is 18 miles. This, it says, is not an occasional occurrence, but frequently happens.

He Knew How.

"Do you want any brakemen?" inquired a seedy looking chap of McMaster, at the General Superintendent's office, yesterday. Mac said they did; road rushed with business and men all overworked. "Guess I'll try it a spell," said the stranger. "All right sir," replied Mac. "Ever on any braking?" "Y-a-a-a." "What road?" "Eh?" "I said what road did you work on?" "The Skowhegan Turnpike; broke on lumber trucks down Johnson hill for two years. That's an awful hill, stranger—two miles long and steeper'n that roof there, and you bet it took a power of muscle to hold her. If a wheel slipped she was gone. I reckon I'm the man you want." He was taken in on probation, and inside of an hour returned, saying the conductor of the crew to which he had been assigned wanted a gallon of red oil for the danger signal lanterns on the rear of the train.—*Doomerang.*

Belgian Suburban Passenger Trains.

The railway from Liege to Maestricht, says a Belgian paper, has obtained permission to put on its track, between Liege and Vise, small trains, made up of cars of the tramway pattern. The fare is between second and third-class, and only of one kind. These trains stop between stations, and thus are a great convenience for the small villages along the route. They are greatly appreciated, and not the least striking fact, the railway company adopted this system in order to prevent the establishment of any competing tramway line. This is an idea that perhaps might be advantageously adopted by some lines in our own country.

An Elevated Railroad in New Orleans.

The New Orleans *Picayune* of recent date says: "More railroads are reaching with their iron arms into this city and all are clamoring for rights of way and track space on the river front, when there is not room for the roads that are already established, and the levee is so badly blockaded by freight piles, acres of cotton and sugar packages, moving masses of drays and wagons, in the midst of which switch engines are dodging in and out, shifting trains to their various destinations. This is the present situation on the levee, and, nevertheless, the railways are clamoring for greater accommodation, while it is admitted on all hands that there is not room to handle properly the steamboat and ship freight. If the above presents only a faint idea of the demands of commerce for space along the river to day, it will not be difficult to see that with the rapid development in the near future the most serious embarrassment to the business of this city must result.

"As the nearest way out of the present trouble and to make provision for the future of the commerce of New Orleans, a corporation, composed of business men among the most deeply interested in the city's prosperity, has been formed to build an elevated railway above the levee and above the heads of the many workers along the river front. It will do the business of shifting trains on the second story, while the levee itself will be delivered over to the men and horses and their busy traffic. Concessions for this enterprise have been made by the City Council, requiring that equal and adequate facilities shall be furnished by this corporation to all the railways desiring to use the company's appliances, while the laws of trade will force the corporation to supply its facilities to its patrons at rates that are just and reasonable.

"A reporter recently visited the office of the Elevated Railway Co., in the Imperial Building, opposite the Cotton Exchange on Carondelet street, and was permitted to inspect the completed plans and drawings of the proposed structures. They will consist, in brief, of a railway track, two tracks, in fact (with sidings where considered necessary), supported on iron columns and extending along the river front from Louisiana avenue to Independence street. At the extremities of this trackway and at the depot grounds of each railroad near which it will pass, inclined tracks will be built, by means of which trains can easily reach the elevated road or descend from it.

"The roadway will be supported on a system of construction which will combine strength and solidity with the least possible obstruction to the free, open space of the levee. The entire system has been carefully studied and designed by able engineers, and is in accordance with the principles upon which the best works of this kind are constructed; for it is no experiment, but is in actual practical use in other cities of this continent and Europe.

"Bids for the construction of the foundations of the work have been advertised for and were to be opened on Saturday, Nov. 3.

"After the foundations shall be laid, the superstructure, which will be mostly of iron, will be rapidly put up."

Transfer of Pullman Cars in England.

The London *Engineer* says: "The directors of the Midland Railway Co. have just completed the purchase of all the Pullman drawing-room cars running on its line from London to Liverpool, Manchester, Glasgow and Edinburgh. It is understood that the Midland Co. takes possession Nov. 1, and the special car conductors have all had notice to leave the service of the Pullman Car Co. The Midland intends to utilize these cars as first-class carriages without any extra charge. It is expected that all first-class passengers will travel in the cars, and that this will enable a number of first-class carriages which at present run half empty to be taken off the train. Each Pullman car weighs about 21 tons, and as two are attached to the Scotch express and the 5 p. m. express from London to Manchester and Liverpool, a great loss is incurred in drawing them when they are frequently nearly empty. The change will secure a reduction in the dead weight of the trains, and the use of two engines on many trains will be avoided. As a second engine costs about 1s. extra per mile run, there will be a large saving in working expenses. The Pullman Car Co. still retains the sleeping cars."

Train Robberies.

A dispatch from Indianapolis, Nov. 4, says: "The train on the Wabash, St. Louis & Pacific road, going east yesterday morning, was boarded at Danville Junction by four men, who went through one of the passenger cars with drawn revolvers and obtained about \$800 from the affrighted passengers. They left the train suddenly, just as it pulled out, and no trace has been found of them. The same crowd, or a similar one, worked the train on the Indiana, Bloomington & Western road, which connects at Danville with the Wabash, by the pickpocket process, getting \$1,200 and a check for \$1,700 on the First National Bank of Clinton, Ill. The check, an overcoat, and a number of pocket-books were afterward found alongside the track."

A Narrow Escape From a Collision.

The Little Falls Correspondent of the Utica (N. Y.) *Herold* telegraphs under date of Nov. 5: "An accident occurred on the West Shore road at the Finch's Basin gravel bed, about one this afternoon. Engine 67, a wild cat, was standing on the main track at the gravel bed waiting for orders to go east, when engine 98 came along with a gravel train running at the rate of 20 miles an hour, with about 60 Italians aboard. When the men saw engine 67 on the main track, they became much alarmed, and about 20 jumped off. Four of them were seriously injured.

"The engineer remained at his post, reversed his engine and applied the air brake, making a stop within two feet of the engine stationed on the cut. The fireman jumped and was slightly bruised. Dr. S. A. Ingham was summoned and cared for the injured."

Killed by a Conductor.

A dispatch from Boonville, Md., Nov. 2, says: "An unfortunate affair occurred at the depot of the Louisville, Evansville, & St. Louis road at this place last night, which will result in the death of one of the participants. Emery Clutter of this place was a passenger on the evening train from Evansville, and, being intoxicated, conducted himself in a boisterous manner. Conductor Joe Kemmer remonstrated, and while on the train he deported himself in a rough manner; so much so that the conductor interfered and threatened to put him off.

"This angered Clutter, and while the train was standing at the depot and the conductor was out on the platform, words were exchanged, and though warned to keep his distance, Clutter advanced toward the conductor, when he received what will prove a fatal blow, crushing in his skull. Clutter is now at his home in this place, and is in a dying condition, his death being expected at any hour. The conductor was arrested, but waived examination, and was held for trial at the December term of court in the sum of \$1,000. Bail was furnished by several of our prominent citizens. Clutter is a perfect giant in form and strength, and, though a peaceful man, when intoxicated is a dangerous person."

A Locomotive Hung up in Air.

A dispatch from Easton, Pa., Nov. 4, says: "This morning, while workmen were engaged in repairing the Lehigh Valley Bridge over the Delaware River, the fast freight came along and before it could be stopped ran along the track to the spot where the repairs were being made. The rails had been removed and heavy wooden timbers spanned the 10 or more feet between the pier and the end of an iron span.

"Some of these timbers had been removed and the locomotive crashed through the remaining ones and lodged against the pier, turning half over. The rear driving wheel caught against the heavy girder of the span and there the engine hangs. To remove it will be no easy task. All day long a force of men have been working over the wreck, but so peculiar was the accident and so difficult the task of getting a purchase on the locomotive that it will require considerable time to remove it. The engine weighs over 70 tons, and as the bridge is over 70 ft. high at the point in question, the magnitude of the work may be imagined. The bridge span is also injured and the damage will be heavy. The accident was occasioned by the engineer of the train being unable to stop after getting the signal, as a pushing engine on the rear of the train, which extended around a curve, could not be notified, and pushed the front of train upon the railless span."

Grade Crossing Signals in Massachusetts.

In Boston, Oct. 30, the Railroad Commissioners gave a hearing on the resolve of the last Legislature for an examination of the various electric signal systems for the protection of highway grade crossings of railroads. President Choate and General Manager Kendrick of the Old Colony, Superintendents Adams of the Fitchburg, Chesley of the Boston & Albany, Furber of the Boston & Maine, Chamberlain of the Providence & Worcester, and other railroad men were present, as well as the representatives of several signal companies. Cyrus S. Holdeman, of the Automatic Electric Signal Co.; Ellis L. Motte and George C. Kynock, of the American Pneumatic Signal Co.; A. W. Hall, of the Hall Railway Signal Co.; Mr. Snyder, of the Union Electric Signal Co.; Justin Hynes, of the American Electric Signal Co. and Mr. McLeod, of the McLeod Air Signal Co., explained the merits of their systems.

Robbing the Pennsylvania Railroad.

For some time past thieves have been making extensive depredations on the contents of cars on the Pennsylvania Railroad, and the company has been compelled to pay shipper thousands of dollars for lost goods. The organized corps of detectives employed by the company were set to work to discover the thieves, but they worked for months without being able to catch the offenders. Several weeks ago Detec-

tives Bond and Donaghy, of this city, were directed to assist Detective Joseph Rue, who was employed by the company to ferret out the criminals. It was discovered at the time of the smash-up during the night on the Junction road, near Frankford, some time ago, when two cars were demolished, and that many valuable goods which the car contained had disappeared before daylight. On Sept. 11 a car loaded with copper ingots, shipped from Indiana to New York City, and while in transit between Newark and Elizabeth on the New York Division, was entered and robbed of 300 pounds of copper.

After investigating these robberies the detectives concluded that the train hands were implicated in the thefts, and a detective took the post of brakeman on the New York Division of the road. He mingled with the trainmen, and after gaining their confidence, succeeded in learning that the thieves were not only the trainmen, but were assisted in their work by the conductors. Information secured in this manner led to the arrest of Peter Provost, an engineer, and George A. Bowers, a brakeman. They confessed their guilt, and gave information which not only led to the recovery of a large amount of the stolen property, but which implicated others who had participated in the thefts. Accordingly Thomas Haines, flagman; Robert Tideman, brakeman; Ernest Mills, fireman; Robert Brackett, brakeman; James Mahoney, brakeman; Stephen Foster, conductor, and Albert Mullen, brakeman, were taken into custody, Foster being arrested yesterday afternoon. He was given a hearing later in the afternoon, and Mullen testified that on Sept. 11 he secured the key of a freight car from Foster, who was the conductor of the train, and that he and George A. Bowers carried off 300 pounds of copper, which they disposed of. Of the money they realized from the sale of the copper they gave Foster \$5 as his share. Foster was held for trial. It is the intention of the company to prosecute any man who has any connection with the robberies, and it is likely that more arrests will be made.—*Philadelphia North American*, Nov. 2.

A Compound Locomotive on the Boston & Albany.

The adoption of the compound engine by ocean steamers a few years ago and the resulting economy in fuel set railroad men to thinking whether a similar plan could not be utilized for locomotives with profit. As a result, Henry Dunbar, of Hartland, Vt., has invented a four-cylinder high-pressure freight engine which is expected to cause a saving of 33 per cent. in fuel. The engine is now being built at the Boston shops of the Boston & Albany road and will soon be tried. It is an adaptation from a three-cylinder engine, invented by Mr. Webb, of the London & Northwestern Railway. In the Webb engine there was a large cylinder 26 in. in diameter directly under the smoke-stack, and on either side of this were two high-pressure cylinders 11½ in. in diameter. The Dunbar engine does away with the centre cylinder, and has two 26 in. cylinders, each arranged in connection with a smaller one so that the latter shall exhaust into the larger, and thus utilize the steam a second time. The cylinders are so fixed that live steam can be used in all of them at the same time, thus giving an immense power; but the chief object is to utilize the exhaust steam. There are really two engines, independent of each other, save so far as the rails may be said to couple the four driving-wheels. The boiler will be so large that the engine can carry 160 pounds of steam, as do first-class passenger locomotives; but the drivers will be only 4½ ft. in diameter. The machinery is the same as that of an ordinary engine, and if four cylinders fail to do the work expected they can be taken out and one pair put in. If, however, a saving of 10 per cent. in fuel is effected, the engine will be voted a success.—*Springfield Republican*, Nov. 2.

A Japanese Railroad.

A portion of the Tokaido (a leading highway) is now nearly deserted on account of the Tokio-Yokohama Railroad. Close to Yokohama is a small town called Kanagawa, and from this place the pilgrims now commence their tramp. Kanagawa is about 18 miles from Tokio, and third-class passengers can ride there for about 20 cents, certainly much cheaper than an 18-mile walk with the cost of a lunch.

The Tokio-Yokohama Railroad is a government affair, as everything else is here. Although it cripples individual enterprises, it secures the success of a thing to have the government control it. The railroad and the telegraph systems are very satisfactory, and the postal system is just about perfect.

Trains are run between the two stations every hour and a quarter during the day, leaving both stations simultaneously. The whole equipment is English. The cars are divided into three classes. Even the first-class cars are decidedly plain. These are divided into three compartments. The second-class cars would hardly be used on a horse railroad in Boston. They are as plain as plain can be, and made just like a horse car, having two long seats on the sides facing each other. The seats are upholstered with the same kind of matting which the Japanese use on their floors.

The third-class cars have simply plain benches for seats. The exterior of all three classes is the same. Third-class passengers are bolted into the cars. The engines are smaller than the shifting engines in the Boston depots. The time required for the 18 miles ride is 57 minutes. Everything pertaining to the road is kept in the best condition. The road-bed is like a floor; the cars are clean; the stations are clean; all the officials are uniformed. I never knew one of them to be in any way impolite. Passengers are not allowed to cross the track except by the bridges overhead. Following English custom, trains run on the left-hand track. No baggage is allowed to go free, save such as one can take in his hand. You can take no living thing into the train, not even a canary, without paying an extra price. Posted up in the stations is a notice to the effect that the government does not run the railroad for the transportation of dogs, but if dogs must travel provision has been made for them. So every station is provided with boxes latticed on top, in which poodle or mastiff can be transported for a definite sum.

Let us start on our 18 miles' ride from the Tokio station. It is a fine large building, built of stone, having two large entrances in front. The waiting-rooms are furnished with the daily native and foreign papers. Five minutes before the train starts a warning bell is rung. The ticket office is styled a "booking office," and a notice tells you that you must be "booked" before you can enter the train.

Just before the train starts the bell is again rung in the station and the door closed, so there is no possible chance for a belated passenger to run for the train and possibly get run over by the train. There are no side doors either through which you can dodge the official.

Having booked yourself, or purchased your ticket, you are allowed to pass through a very narrow passageway to the outward-bound train, showing your ticket as you pass. Although there is no gold leaf or bird's-eye maple on the cars, there are other arrangements that more than compensate for this loss of elegance.

No official goes with the train; no brakeman in dulcet tones whispers out the name of the next station. The only brake on the train is on a car made specially for that purpose and attached at the rear of the engine. No conductor shouts "Tickets, please," and when he has finished his rounds sits down by the fair miss who goes daily for her music lessons. Every passenger is expected to enter the class car for which he holds a ticket. If he doesn't do this and he is found out there is a penalty for his misdemeanor.

When it is time for the train to start an official on the platform blows a little whistle, the steam engine blows a shrill whistle, which would be terrific if it were only powerful enough, and off we go. And now we see one advantage over the average American railroad—there is not the slightest jerk in starting; indeed, you never know when you are in motion unless you look at objects outside the window.

The train glides (that just expresses it); not swiftly to be sure, for if it were swift probably the Japs would condemn it. Nothing upsets a native like swiftness; time is no object here.

The road follows the Tokaido and the coast of the bay most of the distance. It is nearly a dead level. On both sides are the rice fields, where, at this time of the year, the farmers stand nearly up to their knees in mud, setting out the rice plants. There is nothing particularly attractive to see, unless on a bright day you watch the changing forms of that noble mountain—Mount Fuji—the "peerless," as it towers up in the distance.

Every one in the car has a morning paper. Most of the passengers are sitting on their feet, which are crossed under them—a favorite posture.

It is generally the custom to read aloud. The reading is very peculiar, being mostly in a monotone, with occasionally a rise and fall in the tone. Some of the people have a very disagreeable habit of sucking the breath between their closed teeth. The noise thus made with unceasing regularity is almost unendurable if one has any nerves.

The Japanese are not a meddlesome people, and traveling with them is attended with almost no risk. A single lady could travel with a car-load of Japanese men, and there would be not the slightest improper word spoken or act committed.—*Correspondence Boston Transcript*.

General Railroad News

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Baltimore & Ohio, annual meeting, at the office of the company in Baltimore, Nov. 19, at 10 a. m. Transfer books close Nov. 8.

Manhattan, annual meeting, at the office in New York, Nov. 14, at noon.

Mobile & Ohio, annual meeting of debenture-holders to nominate directors, at the company's agency, No. 11 Pine street, New York, Nov. 21, at noon.

New Orleans & Northeastern, annual meeting, at the office in New Orleans, Dec. 3, at noon.

New York & New England, annual meeting, at the Meridian Hall, in Boston, Dec. 11, at 11 a. m. Transfer books close Nov. 7.

Old Colony, annual meeting, at the United States Hotel in Boston, Nov. 27, at 10:30 a. m.

Dividends.

Dividends have been declared as follows:
Pennsylvania, 4½ per cent. semi-annual, payable Nov. 30, to stockholders of record Oct. 31. The dividend will be payable, at the option of stockholders, all in cash or 2½ per cent. in cash and 2 per cent. in scrip, convertible into new stock.

Railroad and Technical Conventions.

The *New England Railroad Club* will hold its regular monthly meeting at its rooms in Boston on the evening of Wednesday, Nov. 14. The change of the meeting night from the second to the fourth Wednesday of the month will take effect until further notice. At this meeting Mr. R. E. Jennings, of West Bergen, N. J., will read a paper, the subject of which will be "Steel and its Uses in Connection with Railroad Service."

New York Railroad Commission.

A dispatch from Albany, N. Y., Nov. 1, says: "The Railroad Commission has refused to allow the New York & Sea Beach Railroad Co. to increase its capital stock from \$500,000 to \$600,000. The Commission found items wrongfully charged to the construction accounts. This is the first decision of the kind made by the Commission."

American Society of Mechanical Engineers.

On the second day of the meeting last week, Nov. 2, Prof. Egleston presented the report of the Committee on Tests. On the recommendation of this committee it was agreed to appropriate the sum of \$200 for the republication of the report of the committee printed in the Transactions of the Philadelphia meeting. This committee, in co-operation with committees of other technical societies, is endeavoring to procure the passage of a bill through Congress reconstituting the commission for making tests of materials.

Mr. James C. Bayles reported, in behalf of the Committee on the Holley Memorial, that the amount necessary to be expended in putting up the sort of monument to Alex. L. Holley, contemplated by the three societies, had been raised. The monument, however, could not be erected in Central Park until five years after Mr. Holley's death.

The following resolution was adopted:

"Resolved, That the Council be requested to appoint a committee of three members to co-operate with committees representing the Institute of Mining Engineers and the Society of Civil Engineers, to consider and report what action should be taken by this society in the event of an expression by the British Iron & Steel Institute, of a desire to hold a meeting in this country in 1894."

The balloting for officers was announced to have resulted in the election of the following: President, Prof. John E. Sweet; Vice-Presidents, A. B. Couch, W. R. Eckart and J. V. Merrick; Managers, W. F. Durfee, Oberlin Smith and C. C. Worthington; Treasurer, Charles W. Copeland.

Mr. J. C. Hoadley read a paper on "A Tumbling Water Meter for Experimental Purposes."

Prof. Egleston read a paper describing "A Machine for Observing the Physical Changes of Metals."

Mr. W. F. Durfee read a paper on "A Power Crane."

Mr. Carl Angstrom presented a paper describing a new valve motion.

A "Note on the Pressure Attained under a Drop Press" was read by Prof. Thurston.

Mr. Oberlin Smith read a paper on "Machine Shop Algebra."

The morning of Nov. 2 was occupied by an excursion to Stamford, Conn., where the works of the Yale & Towne Manufacturing Co. were visited. In the evening Mr. C. J. H. Woodbury read a paper by Prof. John M. Ordway entitled "Experiments upon Non-conducting Coverings for Steam Pipes."

All the papers read, excepting Mr. Smith's, were very fully discussed.

The following papers were read by title:

"Motive Curves for the Slide Valve," by A. W. Robinson.

"The Theory of the Turbine," by Prof. Thurston.

"Compression as a Method of Governing Steam Engines," by Harris Taylor.

Prof. Thurston gave a brief abstract of his paper on the turbine.

On Nov. 3 most of the members went on an excursion to Kingston, N. Y., over the New York, West Shore & Buffalo road.

ELECTIONS AND APPOINTMENTS.

American Society of Mechanical Engineers.—At the annual meeting in New York, Nov. 1, the following officers were chosen: President, John E. Sweet, Syracuse, N. Y.; Vice-Presidents, A. B. Couch, Philadelphia, W. R. Eckart, San Francisco, and J. V. Merrick, Philadelphia; Secretary, F. R. Hutton, New York; Treasurer, C. W. Copeland, New York; Managers, W. F. Durfee, Bridgeport, Conn., Oberlin Smith, Bridgeton, N. J., and C. C. Worthington, New York.

Brooklyn & Montauk.—At the annual meeting in New York, Nov. 7, the following directors were chosen: J. D. Campbell, Austin Corbin, T. W. Dunton, Henry Graves, E. B. Hinsdale, Wm. H. Jackson, Wm. Floyd Jones, Daniel Lord, H. W. Maxwell, J. R. Maxwell, A. H. Stevens, Alfred Sully, F. D. Tappan. The road is leased to the Long Island Company.

Buffalo, New York & Erie.—At the annual meeting in Buffalo, Oct. 31, the following directors were chosen: Thomas Brown, Thomas Brown, Jr., Sidney Cornell, Henry H. Cook, J. A. Davenport, Augustus Frank, John A. C. Gray, John C. Gray, Charles F. Hunter, D. N. Lockwood, John A. Manning, Henry Martin, Samuel W. Millbank. The road is leased to the New York, Lake Erie & Western.

Central Vermont.—Mr. John W. Hobart, for a number of years past General Superintendent, has been appointed General Manager, to date from Nov. 1. This is a new office with this company.

Chicago & Atlantic.—The following circular announces officially an appointment heretofore noted: "The locomotive and car departments of this road having been consolidated under one management, and Mr. George A. Hill appointed Master Mechanic in charge of both, all instructions from him will be duly respected. Appointment to take effect Nov. 1."

Chicago & Eastern Illinois.—The new board has elected Horace H. Stevens, of Boston, President, in place of F. H. Story, and George W. Ball, of Worcester, Mass., Vice-President, in place of D. J. Mackey. No appointment of General Manager has been made.

Chicago, St. Louis & Pittsburgh.—Mr. S. H. Church has been appointed Superintendent of Transportation, with office in Columbus, O. He holds the same office on the Pittsburgh, Cincinnati & St. Louis road.

Danbury & Norwalk.—At the annual meeting last week the following directors were chosen: J. Sargent Cram, Ebenezer Hill, George M. Holmes, Lucius P. Hoyt, Frederick St. John Lockwood, Wm. B. F. Lockwood, Charles H. Merritt, David W. Plumb, Charles L. Rockwell, Stephen H. Smith, Edmund Tweedy. The board elected Frederick St. John Lockwood, President; Harvey Williams, Secretary and Treasurer; Lewis W. Sandiforth, Superintendent.

Hannibal & St. Joseph.—At the annual meeting in Hannibal, Mo., Nov. 5, the following directors were chosen: Peter Geddes, John N. A. Griswold; W. J. Ladd, Charles J. Paine, Henry Parkman, C. E. Perkins, E. Pratt, Elihu Root, A. G. Stanwood. The company is controlled by the Chicago, Burlington & Quincy.

Jacksonville, St. Augustine & Halifax River.—Mr. W. Jerome Green, of Utica, N. Y., has been chosen President. He has appointed Mr. W. L. Crawford General Manager, with office at Jacksonville, Fla. Mr. H. S. Ming has been appointed Superintendent.

Jacksonville, Tampa & Key West.—Mr. M. R. Moran has been appointed General Freight and Passenger Agent, with office in Jacksonville, Fla. He was recently on the New London Northern road.

Massachusetts Central.—At the annual meeting in Boston, Nov. 3, the following directors were chosen: S. N. Aldrich, Eliza S. Converse, Wm. M. Gaylord, Henry F. Hills, Lyman Hollingsworth, Charles R. McLean, Wm. T. Parker, Thomas H. Perkins, Moses W. Richardson, J. E. Smith, Henry Woods. The election is only a formality, as the road has already passed to the bondholders.

Memphis & Charleston.—Mr. Charles Johnson has been appointed Paymaster in place of John Bradley, who has gone to the Louisville, New Orleans & Texas road.

Mexican Central.—Mr. D. B. Robinson, now General Superintendent of the Chihuahua Division, will succeed Mr. Randolph Fink as General Manager, and will have charge of the entire line.

Michigan & Ohio.—At the annual meeting, Nov. 1, the following directors were chosen: Calvin S. Brice, W. A. Brown, C. R. Cummings, W. B. Howard, George Ingersoll, J. A. Latcha, E. R. T. Lyman, John T. Martin, George I. Seney, Samuel Thomas. The board elected J. A. Latcha, of Cleveland, O., President. Mr. Latcha had charge of the building of the road as Chief Engineer.

Missouri Pacific.—It is stated that Mr. J. M. Vandyne is to be Superintendent of the Texas Pacific Division in place of J. M. Eddy, resigned.

Mr. M. M. McDonough has been appointed Road-Master of the Texas & Pacific Division between Marshall, Tex., and New Orleans.

National Railway Publication Co.—Mr. Wm. H. Wolverton has been chosen President in place of Henry W. Gwiner, deceased.

New London Northern.—General Passenger Agent M. R. Moran having resigned, the duties of that office will, for the present, be divided between Mr. J. H. Southard, Auditor, and C. F. Spaulding, Acting Superintendent. The former will have charge of the accounts with agents and connecting roads, and matters pertaining to rates and divisions should be addressed to Mr. Spaulding.

Northern Pacific.—Vice-President Thomas F. Oakes will, for the present, act as General Manager of this road in place of Gen. Herman Haupt, resigned.

Nova Scotia Government Railways.—Mr. Charles A. Scott has been appointed General Manager of the Government railways of Nova Scotia. Mr. Scott was formerly General Manager of the Government railways of Quebec, where he made an excellent reputation for ability and energy.

Philadelphia, Germantown & Norristown.—At the annual meeting in Philadelphia, Nov. 5, the following directors, one-third of the board, were chosen for three years: George H. Colket, John F. Gilpin, John Stingluff, T. W. Walker, I. V. Williamson. The road is leased to the Philadelphia & Reading.

Pittsburgh, Cincinnati & St. Louis.—Mr. S. H. Church has been appointed Superintendent of Transportation, with office in Columbus, O. He has been for some time Assistant to the Manager.

Richmond & Danville.—Second Vice-President A. L. Rives has been appointed General Manager also, in place of Col. T. M. R. Talcott, resigned.

Rochester & Pittsburgh.—Mr. George W. Johnson has been appointed Road-Master of the Buffalo Division, and Mr. George W. White Road-Master of the Rochester Division.

Sault Ste. Marie Canal.—Capt. W. W. Rich has been appointed Chief Engineer. He was recently on the Minneapolis & St. Louis road.

Southeastern, of Canada.—The following appointments have been made under the trustees: H. MacDiarmid, Assistant Superintendent; A. G. Eastman, Mechanical Superintendent; G. Shanks, General Road-Master; F. MacFarlane, Bridge Master; A. F. Robinson, Wood Agent; with headquarters at West Farnham, except Mr. Robinson, who will be located at Waterloo. Mr. H. A. Alden having resigned, the office of Superintendent will be abolished. The Assistant Superintendent will have charge of the train and station service, and all train orders will be given in his name. The Bridge-Master will have charge of the repairs to stations and buildings, as well as bridges.

Toledo & Indianapolis.—The United States Circuit Court has appointed David Robinson, Jr., receiver of this road.

Transcontinental Traffic Association.—At a meeting held in Chicago, Nov. 1, the members of this association (the Pacific coast pool) elected George W. Ristine Commissioner. Mr. Ristine recently resigned his position as General Manager of the Texas & St. Louis road; he had previously served as Assistant General Manager of the Denver & Rio Grande, and Manager of the Empire Line. He has not yet accepted the position.

United States Central.—The directors chosen at the organization of this company last week are: William W. Walker, John Sharp, A. D. Sharon, Lyman Bridges, E. T. Wells, Charles Kohler, R. H. Lloyd, J. H. Kinkead, M. Skelly, William L. French, Robert Turner, D. L. Randolph, Sampson Tams. The general office is at No. 702 Market street, San Francisco. The officers are: President, W. W. Walker, Cedar Rapids, Ia.; Vice-Presidents, John Sharp, Salt Lake City, Utah; E. T. Wells, Denver, Col.; Sampson Tams, San Francisco; Secretary, Chas. E. Walker, San Francisco; Treasurer, R. H. McDonald, Jr., San Francisco; Auditor, F. Medge, San Francisco; Chief Engineer, Lyman Bridges, San Francisco; Counsel and Right of Way Agent, W. L. French, San Francisco; Attorneys, R. H. Lloyd, San Francisco; E. T. Wells, Denver, Col.

PERSONAL.

—A Mexican dispatch says that Mr. Rudolph Fink has tendered his resignation of the office of General Manager of the Mexican Central road, to take effect Jan. 1 next.

—Mr. Frank Raum has resigned his position as President of the Woodruff Sleeping Car Co., to take effect Dec. 18. Mr. Raum has been the chief organizer and leading spirit of the company.

—Mr. Wm. Swinburne, one of the very few remaining of the first generation of locomotive builders in this country, died in Paterson, N. J., Nov. 4, in his 79th year. An extended notice of his life will be found elsewhere.

—Mr. Sidney Smith, formerly of the Boston Water-Works, and recently connected with several railroads in the United States and Mexico, is now Chief Engineer of the water-works which are to be constructed for the purpose of supplying water to the seaport city of Tampico, Mexico. It is expected that the new railway lines and harbor improvements now in progress will make Tampico one of the most important ports in Mexico, and the supply of water is intended to be sufficient for a large town.

—Mr. Archibald Dickson, Paymaster of the Allegheny Valley road, last week suddenly handed in his resignation, and at once left Pittsburgh. The next heard from him was a dispatch received from Toronto, Nov. 2, stating that he had committed suicide in that city by taking laudanum. Mr. Dickson was still a young man and was highly esteemed by the officers of the company and his associates; his accounts were entirely correct, and there seems to be no doubt that he committed suicide during a temporary aberration of mind. He had been suffering from an aggravated form of dyspepsia for some time.

—Mr. John W. Twigg has resigned his position as Assistant General Master Mechanic of the Michigan Central Railroad, to take charge of the works of the Chippewa Falls Foundry & Machine Co., Chippewa Falls, Wis., in which he is the principal stockholder. As Mr. Twigg is about to leave for his new home, his many friends on the road met last week at his residence in Jackson, Mich., and presented him with an elegant cabinet desk and an address expressing their high esteem for him and their regret at parting with him. At the same time the employees of the West Division presented him with a handsome china dinner set.

—Hon. Theodore F. Randolph died very suddenly at his residence, Morristown, N. J., Nov. 7, aged 57 years. Mr. Randolph was for many years a prominent citizen of New Jersey, and his public career in the Legislature and as Governor of that state and United States Senator is well known. He was for a number of years a director of the Morris & Essex Railroad Co., and was President of that company for several years before his election as Governor. After his term had expired he was again chosen President. Gov. Randolph was a man of strict integrity, and always had the respect of his political opponents. He was warm-hearted and genial, agreeable in his manners, and, to the last, fresh and youthful in his feelings. In his friendships he was notably staunch and tenacious. His death will be the cause of profound regret in all parts of New Jersey.

—Gen. Herman Haupt has resigned his position as General Manager of the Northern Pacific Railroad. The reasons for his resignation are given in the following letter, addressed by him to Vice-President Oakes:

"DEAR SIR: I have received from you instructions to curtail expenses in every department, to discontinue work in progress and to discharge employees who have served the company efficiently. The restrictions that have been placed upon its General Manager are of such a nature that I cannot see how it is possible to continue in the management and secure results that will be at the same time creditable to myself and satisfactory to stockholders. As you propose to de-

vote a considerable portion of your time personally to direction of operations, it is clearly unnecessary to retain the services of General Manager in addition, and I therefore prefer to sever my connection with the company, subject to the five years' contract under which I assumed charge in 1881."

Gen. Haupt went to the Northern Pacific as General Manager in 1881, succeeding Mr. H. E. Sargent. It was then stated that he had made a contract with the company for five years, and it is doubtless to this contract that his letter refers. His resignation has been accepted.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Ten months ending Oct. 31:

	1883.	1882.	Inc. or Dec.	P. c.
Chi. & Alton.....	\$7,165,744	\$6,758,512	I.	\$407,232 6.0
Chi. & East. Ill.....	1,373,107	1,483,021	D.	109,914 7.2
Chi., Mil. & St. P.....	19,121,000	16,349,037	I.	2,771,963 17.0
Chi. & N. W.....	20,810,305	20,041,261	I.	769,044 3.8
Chi. St. P. & O.....	4,460,121	4,082,240	I.	377,881 9.3
C. & N. O. & T. P.....	2,134,756	2,113,586	I.	21,170 0.5
Denver & R. G.....	6,147,450	3,303,290	I.	2,844,160 86.4
Hann. & St. Jo.....	2,113,993	1,890,507	I.	223,486 12.0
Long Island.....	2,355,614	2,162,082	I.	193,532 9.4
Louis. & Nash.....	11,563,265	10,246,248	I.	1,317,017 12.8
Mil. L. S. & W.....	845,224	714,750	I.	130,474 18.2
Northern Pacific.....	7,958,903	5,678,202	I.	2,280,702 40.2
St. L. & San Fran.....	3,084,686	2,911,443	I.	173,243 5.9
St. P. & Duluth.....	1,096,287	888,068	I.	208,280 23.5
St. P. M. & M.....	6,848,859	7,067,793	D.	218,934 3.5

Nine months ending Sept. 30:

	1883.	1882.	Inc. or Dec.	P. c.
Atch. T. & S. F.....	\$10,309,187	\$10,535,128	D.	\$225,941 2.2
Net earnings.....	5,532,686	4,242,457	I.	1,290,229 30.4
Southern Kan.....	1,201,406	904,545	I.	296,861 32.8
Net earnings.....	629,308	470,882	I.	158,426 33.6
Ches. & Ohio.....	2,879,286	2,429,579	I.	449,707 18.4
Net earnings.....	977,452	740,338	I.	237,114 32.0
Eliz. L. & B. L.....	532,827	362,751	I.	170,076 46.9
Net earnings.....	168,538	111,314	I.	57,224 51.5
Chi., Bur. & Quin.....	18,634,197	15,053,879	I.	3,580,318 23.8
Net earnings.....	9,042,649	6,984,127	I.	2,058,522 29.5
C. C. & Ind.....	3,051,076	3,102,338	D.	111,262 3.5
Oregon & Cal.....	710,569	.....	.....	.....

Month of September:

	1883.	1882.	Inc. or Dec.	P. c.
Atchison, Top. & S. F.....	\$1,203,257	\$1,329,113	D.	\$125,856 9.5
Net earnings.....	711,146	727,027	D.	15,881 2.2
South. Kansas.....	159,725	146,450	I.	13,275 9.1
Net earnings.....	89,803	84,120	I.	5,683 6.8
Buff. N. Y. & Phila.....	268,353	241,424	I.	26,929 11.2
Net earnings.....	145,016	135,204	I.	9,812 7.3
Ches. & Ohio.....	365,473	332,219	I.	33,254 10.0
Net earnings.....	153,306	135,061	I.	18,245 13.5
Eliz. L. & B. L.....	76,934	57,352	I.	19,582 34.6
Net earnings.....	36,388	20,220	I.	16,168 82.3
Chi., Bur. & Q.....	2,909,165	2,186,400	I.	722,765 33.1
Net earnings.....	1,579,552	1,231,837	I.	347,715 28.2
Cleve., Col. (in. & Ind.....	405,246	452,246	D.	47,000 10.4
Oregon & Cal.....	106,300	.....	.....	.....
Og. & L. Cham.....	72,200	73,000	D.	800 1.1
Net earnings.....	27,900	31,200	D.	3,300 10.6

Month of October:

	1883.	1882.	Inc. or Dec.	P. c.
Chi. & Alton.....	\$864,538	\$852,673	I.	\$11,865 1.4
Chi. & East. Ill.....	144,958	175,305	D.	30,347 17.8
Chi., Mil. & St. Paul.....	2,530,000	2,250,974	I.	279,026 12.4
Chi. & N. W.....	2,789,400	2,601,400	I.	188,000 7.2
Chi. St. P. & O.....	648,100	549,300	I.	98,800 18.0
Chi. N. O. & Tex. Pacific.....	2,258,865	2,384,475	I.	20,390 8.6
Denver & R. G.....	706,550	630,500	I.	136,350 21.8
Hann. & St. Jo.....	247,169	248,144	I.	1,025 0.4
Long Island.....	210,779	203,908	I.	6,871 3.4
Louis. & Nash.....	1,477,900	1,215,932	I.	261,968 21.5
Mil. L. S. & W.....	109,750	83,414	I.	26,336 31.6
Northern Pacific.....	1,324,000	839,831	I.	484,169 57.7
N. Y. & N. Eng.....	346,240	297,030	I.	49,210 16.6
Roch. & Pitts.....	84,417	28,868	I.	55,549 192.2
St. Louis & S. F.....	361,500	360,700	I.	800 0.2
St. P. & Duluth.....	161,959	146,023	I.	15,936 10.9
St. P. M. & M.....	916,071	978,876	D.	62,805 6.4
Week ending Oct. 27:	.....	.....	.....	.....
Chi. & G. Trunk.....	\$59,207	\$59,102	I.	\$105 0.3

Early reports of earnings are generally estimated in part, and are subject to correction by later statements.

Grain Movement.

For the week ending Oct. 27 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past ten years:

Year.	Northwestern receipts.	Total.	By rail.	P. c.	Atlantic receipts.
1874.....	2,578,641	2,412,374	292,512	12.1	2,555,461
1875.....	4,251,118	4,597,686	1,154,484	25.2	3,124,679
1876.....	4,308,747	3,902,672	2,351,914	60.3	4,010,805
1877.....	5,071,098	3,827,013	587,178	15.3	5,435,919
1878.....	4,893,449	4,088,021	905,027	22.1	6,262,386
1879.....	7,190,708	4,443,656	1,390,496	31.3	7,481,102
1880.....	8,166,432	6,748,761	2,324,182	34.4	9,100,198
1881.....	4,400,918	4,264,210	1,886,258	44.3	3,553,019
1882.....	6,278,640	3,317,149	1,884,056	57.1	3,530,975
1883.....	6,356,610	5,630,005	2,127,925	42.3	4,230,002

Thus the receipts of the Northwestern markets for the week were very nearly the same as in the corresponding week of last year, but were exceeded in 1880 and 1879. Last year the receipts of this week were the largest since August; this year they were nearly the same as in the week next preceding, but with that exception were the smallest since the middle of August.

The shipments from these markets for the week were 2,000,000 bushels more than in the corresponding week of last year, and have been equaled in no corresponding week except in 1880. They were, however, 250,000 bushels less than in the previous week of this year and the smallest for ten weeks. The rail shipments were larger than in any corresponding week when rates were maintained. The quantity that went down the Mississippi was 86,066 bushels and 1.7 per cent. of the whole.

The Atlantic receipts for the week were 708,000 bushels more than in the corresponding week of last year and more also than in 1881, but much smaller than in any of the four years next preceding, and not half as great as in 1880. They were somewhat less than in the previous week of this year.

The receipts at Milwaukee this week were the largest it has had since June, and with one exception the largest it has had this year. The Toledo receipts were the smallest since July, and not half its average in August and September. The St. Louis receipts are somewhat larger than recently; the Duluth receipts were but 306,000 bushels, having exceeded 500,000 in each of the four weeks previous. The near approach of the close of navigation is likely to soon put an end to shipments to that place, as there is a much shorter outlet for wheat carried east by rail.

Exports from Atlantic ports in this week to Oct. 27 for four successive years have been:

	1880.	1881.	1882.	1883.
Flour, bbls.....	133,707	70,392	163,261	204,738
Grain, bush.....	4,447,870	2,277,039	1,576,153	2,180,709

The exports this year are nearly a third more than last year and more than in 1881, but much less than in 1880.

Buffalo grain receipts by lake from the opening of navigation to Oct. 31 were as follows, flour in barrels and grain in bushels, flour being reduced to wheat in the totals:

	1883.	1882.	Increase.	P. c.
Flour.....	1,783,163	1,585,299	197,864	12.5
Grain.....	59,993,069	42,941,306	16,452,063	38.6
Total, bushels.....	68,009,484	50,568,100	17,441,384	34.5

The flour receipts are the largest reported in 12 years. In that period the grain receipts have been exceeded four times, in 1880, 1879, 1878 and 1874. The total receipts (grain and flour together) have been exceeded but twice, in 1880 and 1878.

Shipments eastward of grain received by lake up to Oct. 31 were as follows, in bushels:

	1883.	1882.	Inc. or Dec.	P. c.
By canal.....	39,210,048	26,703,632	I.	12,506,416 46.8
By rail.....	13,439,522	10,033,365	I.	3,406,157 33.9
Total.....	52,649,570	36,736,997	I.	15,912,573 43.3
Per cent. by rail.....	25.5	27.3	D.	1.8

The canal opened May 7 this year and April 11 last year, giving 26 days more of navigation last season than this. The total number of boats cleared from Buffalo on the canal to Oct. 31 this year was 6,099; in 1882 it was 5,921, showing an increase of only 178 boats cleared, in spite of the large increase in grain shipments.

Coal.

Coal tonnages reported for the week ending Oct. 27 are as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Anthracite.....	756,354	696,597	I.	59,757 8.6
Semi-bituminous.....	128,318	117,114	I.	11,204 9.6
Bituminous, Penna.....	77,657	61,785	I.	15,872 25.7
Coke, Penna.....	63,071	55,258	I.	7,813 14.1

Anthracite production continues large. The demand for the sizes chiefly used for domestic purposes is reported better, but that for steam sizes is falling off. There is now nothing said of a stoppage of production, and no restriction is probable before January.

The coal tonnage of the Pennsylvania Railroad for the week ending Oct. 27 was as follows:

	Coal.	Coke.	Total.
Line of road.....	156,547	52,449	208,996
From other lines.....	57,708	11,022	68,730
Total.....	214,255	63,471	277,726

The total tonnage this year to Oct. 27 was 9,950,206 tons, against 9,062,057 tons to the corresponding date last year; an increase of 888,149 tons, or 9.8 per cent.

The anthracite coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the ten months ending Nov. 3 was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Coal Port for shipment.....	105,658	84,050	I.	21,608 25.7
S. Amboy for shipment.....	508,048	625,519	D.	117,471 23.1
Local points on N. J. divs.....	696,284	623,461	I.	72,823 11.7
Co.'s use on N. J. divs.....	136,747	110,129	I.	26,618 24.2
Total.....	1,446,737	1,443,180	I.	3,558 0.3

Of the total tonnage for the ten months this year, 1,188,299 tons were from the Lehigh Region, and 258,438 tons from the Wyoming Region.

Actual tonnage passing over the Huntingdon & Broad Top road for the ten months ending Nov. 3 was as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Broad Top coal.....	163,317	238,730	D.	75,413 31.5
Cumberland coal.....	408,486	155,337	I.	253,149 163.0
Total.....	571,803	394,067	I.	177,736 45.1

The Broad Top coal is mined on the line; the Cumberland is carried through for the Pennsylvania Railroad.

Lake Superior Iron Ore.

Shipments of ore from the Lake Superior region from the opening of navigation to Oct. 31 are reported by the Marquette Mining Journal as follows, in tons:

	1883.	1882.	Decrease.	P. c.
From L'Anse.....	60,829	62,491	1,662	2.7
From Marquette.....	652,836	875,706	222,870	25.5
From Escanaba.....	1,327,635	1,622,634	295,001	18.2
From St. Ignace.....	50,719	51,539	810	1.6
Total.....	2,092,019	2,612,440	520,421	19.0

are not to be exceeded, and in no case shall any agent use any portion of this commission to cut rates.

"Any line may withdraw from this agreement after the expiration of 30 days' notice being given to the other lines parties hereto."

Cotton.

Cotton movement for the two months of the crop year from Sept. 1 to Nov. 2 is reported as follows, in bales:

Interior markets:	1883.	1882.	Inc. or Dec.	P. c.
Receipts.....	959,476	916,293	I. 43,183	4.7
Shipments.....	733,351	756,727	D. 23,376	3.1
Stock on hand, Nov. 2.....	278,734	175,092	I. 101,642	58.1
Seaports:	1883.	1882.	Inc. or Dec.	P. c.
Receipts.....	1,465,907	1,423,066	I. 42,841	3.0
Exports.....	638,446	728,979	D. 90,533	12.4
Stock on hand, Nov. 2.....	762,547	578,949	I. 183,598	31.7

Of the receipts at interior markets this year 29 per cent. were at Texas points, including Shreveport. The largest receipts reported (214,783 bales) were at Houston, and the next (101,379 bales) at Memphis.

Of the seaport receipts this year, the Texas ports had 16 per cent.; New Orleans, 25 per cent.; the minor Gulf ports, 5 per cent.; Savannah, 20 per cent.; Charleston, 14 per cent.; Norfolk, 11 per cent.; the minor South Atlantic ports, 8 per cent.; and the North Atlantic ports, 1 per cent.

The largest exports reported were from New Orleans (180,347 bales), the next from New York (137,218 bales). Galveston exports were 84,854 bales.

The Commercial and Financial Chronicle puts the total receipts at all ports from the plantations for the two months at 1,693,485 bales this year, against 1,582,273 bales in 1882, and 1,668,761 bales in 1881. These figures do not include overland receipts or Southern consumption; they are simply a statement of the weekly movement from the plantations of that part of the crop which finally reaches the market through the out-ports.

Pacific Through Freights.

Shipments of through freight eastward from Pacific Coast points in September were 20,175 tons, the heaviest reported this year. For September and the nine months ending Sept. 30 these shipments over the Central and Southern Pacific lines have been as follows:

	Central.	Southern.	Total.
September.....	9,929	10,246	20,175
Nine months.....	58,676	46,744	105,420

For the first four months of the year the Southern Pacific carried the largest share of the shipments, but in the succeeding four months the Central Pacific had considerably over half. In September the Southern again took the lead.

The total shipments over the Central Pacific for the nine months were 5,868 car-loads, an average of about 21½ light car-loads daily; the total shipments over the Southern Pacific were 4,674 car-loads, an average of about 17 car-loads daily. The total shipments by the two lines were thus equal to 10,542 car-loads, or an average of 38½ cars a day. For September the shipments make up an average of 61 cars a day, 33 by the Central and 28 by the Southern.

Leading items of freight for the nine months were 13,014 tons sugar, 10,640 tons wool, 10,559 tons canned salmon, 10,418 tons other canned goods, 9,036 tons ripe fruit, 8,392 tons tea, 6,374 tons wine, 2,074 tons wheat, 1,960 tons rice, 1,602 tons beans, 1,273 tons borax and 1,224 tons dried fruit. No other item of freight furnishes as much as 1,000 tons.

Wheat appears for the first time this year in the rail shipments as a considerable item, all but 11 tons having been shipped in September. Canned salmon, which is the third article in amount this year and furnished a little over 10 per cent. of all the freight, is very likely to go by the Northern Pacific hereafter, as nearly all of it comes from the Columbia River.

RAILROAD LAW.

Charter Exemption from Taxation.

In the case of the Memphis & Little Rock Co. against the Railroad Commissioners of Arkansas, the company sought to enjoin the state from assessing the road for taxation under the present law by virtue of provisions in its original charter, claiming exemption under it. The Chancellor held that the road had been sold under foreclosure, and the privilege of exemption from taxation could not pass to the purchaser without statutory enactment. The Court rendered a similar decision in the case of the St. Louis, Iron Mountain & Southern Railroad, whose line in Arkansas was built under the charter of the old Cairo & Fulton Co. Both cases will be appealed.

OLD AND NEW ROADS.

American Rapid Telegraph.—This company has executed a mortgage on the consolidated interests of the line in the states of New York, New Jersey, Ohio, Connecticut, Massachusetts and Pennsylvania, and the city of Baltimore, upon its property and franchises to the Boston Safe Deposit Trust Co. for \$3,000,000. Bonds of \$1,000 each are given for the amount, payable Sept. 15, 1893. The interest is 6 per cent., to be paid semi-annually.

Atchison, Topeka & Santa Fe.—This company makes the following statement for September and the nine months ending Sept. 30:

	September.		Nine months.	
	1883.	1882.	1883.	1882.
Earnings	\$1,203,257	\$1,329,113	\$10,309,187	\$10,545,128
Expenses.....	492,111	602,086	4,776,501	6,292,671
Net earnings..	\$711,146	\$727,027	\$5,532,686	\$4,242,457
P. cent. of exps.	40.9	45.3	46.3	59.7

The mileage for September was 1,820 miles in both years for the nine months it was 1,820 miles this year and 1,813 last year. Taxes are not included in expenses.

For the nine months there was a decrease of \$225,941, or 2.3 per cent., in gross earnings, with a decrease of \$1,516,170, or 24.1 per cent., in expenses, and a resulting increase in net earnings of \$1,290,229, or 30.4 per cent.

For the controlled Southern Kansas road the following statement is made, the mileage for September being 398 miles in both years, and for the nine months 398 miles this year and 390 last year:

	September.		Nine months.	
	1883.	1882.	1883.	1882.
Earnings	\$159,725	\$146,450	\$1,301,406	\$904,545
Expenses.....	63,922	62,330	572,098	433,060
Net earnings.....	\$89,803	\$84,120	\$729,308	\$470,882
Per cent. of exps.	43.2	42.6	47.6	47.9

Taxes are not included in expenses. For the nine months there was an increase of \$296,861, or 32.8 per cent., in gross earnings, with an increase of \$138,435, or 31.4 per cent., in expenses; the result being an increase in net earnings of \$158,426, or 33.6 per cent.

A charge made during the recent political campaign in Kansas that this company had endeavored to secure a large amount of land to which it was not entitled by its grant, is refuted by Col. A. S. Johnson, Land Commissioner

of the road, in a long and interesting letter, in which he shows that the company has received only the land which it has earned under the terms of its grant, and that it has never asked for any more than it was legally entitled to.

On this company's Southern Kansas line a branch has recently been completed from Chanute, Kan., eastward to Walnut, on the Missouri, Kansas & Texas, a distance of 24 miles. Grading has been begun on another branch from Independence, Kan., southwest 25 miles to Peru in Chautauqua County, near the Indian Territory line.

Barnwell.—It was recently announced that train service over this road would be suspended, the rates allowed by the South Carolina Commission being so low that it would be impossible to pay running expenses. The road is a short branch line, running from Blackville, on the South Carolina road, to Barnwell, 9 miles. The South Carolina Co. owns a majority of the stock, but does not lease the road, but the Commission decided to treat it as a branch line and to order the same rates over it as are prescribed for the main line. Later, however, the Commission suspended its order and allowed a continuance of the old rates, and the train service was therefore resumed after a few days' suspension.

Buffalo, New York & Philadelphia.—A circular issued by this company says that the gross receipts for the fiscal year ended Sept. 30 would have been at least \$500,000 additional had the company possessed adequate rolling-stock, sidings, and terminals to handle the business with. The company is in the position of having more business than it can take care of, and therefore needs capital, which if furnished promptly will add largely to its revenues. The mileage of the road is now 763 miles, including 108 miles of sidings. In 1879 the capital (stock and bonds) was \$9,160,000, equal to \$70,461 per mile. In 1883 the capital is \$41,650,000, equal to \$54,454 per mile. In 1879 the gross receipts were \$467,135. In 1883 the gross receipts of the first month in which the road has been operated as one system are \$265,000, or per annum, \$3,180,000. It should be borne in mind that about one-half the present mileage was, four years ago, in a very bad condition; more than half the iron was worn out, more than half the ties were rotten, many of the bridges were unsafe, and the rolling-stock totally inadequate for the business offering. Since 1879 the following improvements have been made at a cost of \$1,634,756: 40 miles new side tracks, 7,500 tons new steel rails, 1,300 tons new iron rails, 308,000 ties, nine new bridges, 20 trestles filled, eight new trestles, four new depots; 19 locomotives have been rebuilt and purchased, 52 passenger cars, 3,482 new freight cars, 106 miles new fence, new coal shutters and storage pockets on the Blackwell Ship Canal, Buffalo. The road and rolling stock are now in excellent condition, and not more than \$250,000 will be required during the coming year to complete the permanent betterments heretofore authorized by the board. For the fiscal year ending Sept. 30, 1883, the gross receipts were about \$2,630,000; the net profits were about \$1,250,000.

After speaking of the prospects of the company's recent purchase, a controlling interest in the Fairmount Coal & Iron Co., the report speaks of future outlays and requirements. The company has ordered 12 additional locomotives under a car trust, and should order in time for the opening of business in the spring of 1884, at least 600 more gondolas. There is no reasonable doubt that they will all be needed.

There has been expended for land in Buffalo for the proposed Union Depot with the New York, West Shore & Buffalo Railroad Co., and in Buffalo and Rochester, for terminals, the sum of \$349,321, of which \$152,696 has been paid in cash, and the balance is due in 1884.

After giving a list of the securities owned by the company, including its own stock and bonds and those of controlled lines, the circular says:

"These securities are more than sufficient to provide for the above expenditures, and to furnish the facilities needed, but the board think it is a wiser plan to create a general mortgage loan of \$25,000,000, bearing 6 per cent. interest, and payable in 40 years, of which \$21,300,000 will be reserved to provide for prior issues, and \$1,700,000 have been sold to pay for the above expenditures, and for the additional facilities much needed, viz:

"1. Improvements on land in Buffalo (65 acres) owned by the company, for storing and shipping anthracite coal to the capacity of 400,000 tons per annum, \$300,000.

"2. Additional land and tracks in Buffalo and Rochester to accommodate the present business, \$125,000.

"3. Completion of shops in Olean; 2,000 tons steel rail for Pittsburgh and River divisions; new bridges at Port Alleghe and Ischua, and new depots and sidings on Rochester Division, \$200,000. Total, \$625,000.

"The balance, \$3,000,000, to remain in the treasury, and only to be issued for additional rolling-stock, land, side tracks, and other permanent betterments of the property, as may seem advisable by the board."

Canadian Pacific.—Ottawa dispatches say that the negotiations in relation to a government guarantee on the stock are still pending.

A special meeting of stockholders was held in Montreal, Nov. 6, for the purposes indicated in the following circular:

"To authorize the company to sell to the Ontario & Quebec Railway Co. a portion of the railway lying between Perth and Smith's Falls; also, to lease the several railways of the Credit Valley Railway Co. and the Ontario & Quebec Railway Co., and part of the railway of the Atlantic & North-west Railway Co., together with the lines leased by these companies respectively, and the appurtenances of these railways; and to lease the lines of any amalgamated company into which the several companies, or any of them, shall merge; and in respect of such lease, and of the assumption or guarantee of the payment of the interest, dividends or coupons upon the securities issued by the several companies, to exercise the powers conferred upon the company by the statute of the Dominion Parliament, entitled,

"An act respecting the Canadian Pacific Railway Co."

The meeting, in which the stock was largely represented by proxy, was unanimous in authorizing the directors to carry out these projects. It then adjourned until Nov. 19.

Cannelton.—This company has been organized to build a short branch road from Cannelton, W. Va., on the Chesapeake & Ohio road, to the lands of the Cannelton Coal Co. on Bell Creek.

Central, of New Brunswick.—The line of this projected road has been substantially agreed on from Fredericton, N. B., eastward to the crossing of Salmon River near the head of Grand Lake, a distance of 37 miles. From Salmon River to the junction with the Intercolonial road several lines are to be surveyed, striking the Intercolonial at Apohaqui, Sussex, Petitcodiac and Salisbury. From Salmon River the distance by these lines varies from 40 to 47 miles.

Central of New Jersey.—In the Dinsmore suit to set aside the lease to the Philadelphia & Reading Co., the United States Circuit Court has granted a motion on the part of the plaintiff to strike out all the testimony taken by the Master which does not strictly apply to the facts as set forth in the complaint.

Chesapeake & Ohio.—This company makes the following statement for September and the nine months ending Sept. 30:

	September		Nine months	
	1883.	1882.	1883.	1882.
Earnings.....	\$365,473	\$332,219	\$2,879,286	\$2,429,570
Expenses.....	212,167	207,158	1,901,834	1,689,241
Net earnings.....	\$153,306	\$125,061	\$977,452	\$749,338
Per cent. of exps ..	58.0	62.4	66.1	69.5

This shows for the nine months an increase of \$449,707, or 18.4 per cent., in gross earnings, with an increase of \$212,593, or 12.6 per cent., in expenses, and a resulting increase in net earnings of \$237,114, or 32.0 per cent.

For the controlled Elizabethtown, Lexington & Big Sandy road, which is the western extension of the main line, the following statement is made:

	September.		Nine months.	
	1883.	1882.	1883.	1882.
Earnings.....	\$76,934	\$57,352	\$532,827	\$362,751
Expenses.....	40,096	37,132	364,289	251,417
Net earnings.....	\$36,838	\$20,220	\$168,538	\$111,314
Per cent. of exps.....	52.1	64.7	68.4	69.3

For the nine months there was an increase of \$170,076, or 46.9 per cent., in gross earnings, with an increase of \$112,352, or 44.9 per cent., in expenses, the result being an increase in net earnings of \$57,224, or 51.5 per cent.

Chicago, Burlington & Quincy.—This company makes the following statement for September and the nine months ending Sept. 30:

	September.		Nine months.	
	1883.	1882.	1883.	1882.
Earnings.....	\$2,909,165	\$2,186,400	\$18,634,197	\$15,053,879
Expenses.....	1,329,613	954,563	9,591,548	8,009,752
Net earnings.....	\$1,579,552	\$1,231,837	\$9,042,649	\$6,984,127
Per cent. of exps.....	45.7	43.7	51.5	53.6

For the nine months this shows an increase of \$3,580,318, or 23.8 per cent., in gross earnings, with an increase of \$1,521,796, or 18.9 per cent., in expenses, the result being a gain in net earnings of \$2,058,522, or 29.5 per cent. September has fully maintained the increase shown for the earlier months of the year.

It is reported that this company will extend its Chicago & Iowa line from Forreston, Ill., by way of Hanover to Galena, about 50 miles. It is also reported that a survey is in progress for a line up the east side of the Mississippi from Galena to La Crosse and that it will be extended to St. Paul.

Chicago & Northwestern.—The Correctionville Branch has been completed and opened for business to Kingsley, Ia., 13 miles westward from the late terminus at Correctionville and 68½ miles from the junction with the Maple River Branch at Wall Lake.

Cincinnati & Eastern.—The Court has authorized the Receiver to complete the road to Portsmouth, O., and to change the gauge from 3 ft. to 4 ft. 8½ in., as proposed, and to issue \$250,000 certificates, or so much thereof as may be necessary, for that purpose.

Columbus & Cincinnati.—This projected narrow-gauge road is to run from Columbus, O., west by south to Waynesville, 72 miles. About 60 miles of the road are now graded, and negotiations are in progress with parties in New York for the iron and equipment. Negotiations are also in progress for a connection with the Cincinnati Northern to complete the line to Cincinnati.

Concord.—The long dispute over this company's affairs is in a fair way of solution, according to a dispatch from Concord, N. H. Arrangements are slowly but surely being perfected to make the directory of the road conform to the decision of the Court rendered last summer. It is substantially agreed, says this dispatch, that Judge Minot shall be trustee to represent the road in so far as its business interests with the Northern and the Boston, Concord & Montreal railroads are concerned, and that Messrs. Vose and Hayes, who hold large interests in the upper roads, shall retire as directors of the Concord road, also that their places shall be filled by the appointment of Messrs. Pearson, of Concord, and Parker, of Manchester, who have no railroad interest adverse to that of the Concord road. This is undoubtedly the plan of adjustment, and only awaits ratification to make it complete.

Corpus Christi & Nueces Valley.—This Company has been organized to build a railroad from Corpus Christi, Tex., up the Nueces River to Oakville, and thence west by north to Uvalde on the Galveston, Harrisburg & San Antonio road, about 200 miles in all.

Danville & New River.—Track on this road is now completed to Spencer in Henry County, Va., 13 miles westward from the late terminus at Martinsville, and 56 miles from Danville. Work is in progress west of Spencer, in Patrick County, and the track will very soon be in that county.

Detroit, Mackinac & Marquette.—The extension of this road from Marquette, Mich., westward so located as to cross the Marquette, Houghton & Ontonagon at Negunee at grade. The latter company objected to the grade crossing as being peculiarly objectionable at a point where heavy ore trains have to be handled on a steep grade. No agreement could be reached by negotiation, and the question has been referred to the Railroad Commissioner for arbitration.

Eastern.—The Boston Advertiser says: "The Eastern Railroad has just closed its fiscal year with the largest earnings in its history—\$3,600,000—and a net balance of \$170,000 in cash, which is to be applied to the extinguishing of the debt. When this company was reorganized in 1876 its gross earnings were \$2,470,000, and nobody expected them to rise to over \$3,000,000 a year."

Fargo Southern.—The grading forces of this company have been temporarily stopped at Wahpeton, Dak., where the St. Paul, Minneapolis & Manitoba Co. refuses to permit the new road to cross its track, and a dispute has broken out between the two companies which will have to be settled in the courts.

The Fargo Southern Co. charges that the officers of the Manitoba road have refused to deliver to its representatives 47 car-loads of ties and other material consigned to them at Wahpeton. The Manitoba officials, however, deny this, and say that they are ready to deliver all freight for the new road upon payment of the charges.

Flint & Pere Marquette.—The Harrison Branch of this road is now completed to Houghton Lake, Mich., 15½ miles northward from last year's terminus, and 31 miles from the junction with the main line. This branch leaves the main line at Harrison Junction and runs northward through Clare and Roscommon counties. It is chiefly used for hauling logs and has a number of short spurs and branches.

Georgetown & North Carolina.—A meeting was recently held at Gaffney City, S. C., to consider the question of consolidating this company with several other organizations, the object being to form one company to build a

narrow-gauge line from Georgetown, S. C., by way of Gaffney City, Rutherfordton, N. C., and Asheville to some point in East Tennessee.

Gettysburg & Harrisburg.—The grading is nearly finished on this road, which is to extend from the South Mountain road, at Hunter's Run, Pa., southward to Gettysburg, about 19 miles. Tracklaying is in progress, and the rails are reported laid for 6 miles from Hunter's Run.

Grafton & Greenbrier.—Grading on this road is reported complete from Grafton, W. Va., on the Baltimore & Ohio road, southward to Philippi, about 23 miles, the line following the upper Monongahela in its general course. Tracklaying has been begun at Grafton. Grading will soon be begun on the extension from Philippi up the Tygerts Valley River to Beverly in Randolph County, a distance of 35 miles. From Beverly the road will cross the divide into the valley of the Greenbrier, and will follow that river southward to the Chesapeake & Ohio near the White Sulphur Springs.

Gulf, Shreveport & Kansas City.—This company has asked the city of Shreveport, La., for aid in the construction of its proposed road from the Sabine River at Logansport, La., through Shreveport to Camden, Ark. The object of the road is to connect the Houston, East & West Texas road with the Texas & St. Louis.

Hartford & Connecticut Western.—The Connecticut Railroad Commissioners, after making the usual fall inspection of this road, says: "We found marked improvement since our spring inspection. When the renewals now in progress at Tariffville and New Hartford are finished, the work of rebuilding your bridges, rebuilding or refilling your trestles, and relaying your tracks with steel, which has been pressed so vigorously for the last four or five years, will be practically completed. And no considerable work of similar character will be required for some time."

Since the reorganization of the company nearly \$500,000 have been expended in laying steel rails, filling trestles, rebuilding bridges, ballasting and other improvements of the road, under the supervision of Superintendent John F. Jones.

There has been some talk lately of reviving the plan for a branch from Tariffville, Conn., northeast to Springfield, Mass., about 17 miles. This branch would complete a new line from Springfield to the Hudson River at Rhinecliff, directly opposite the terminus of the Delaware and Hudson canal at Rondout.

Hartford & Harlem.—The directors of this company have adopted a new location for their projected line through the city of New Haven. This new location will be submitted to the Railroad Commissioners for approval as soon as possible.

Jacksonville, St. Augustine & Halifax River.—A controlling interest in this road has been sold to Mr. W. Jerome Green, of Utica, N. Y., who purposes completing the road into St. Augustine and pushing forward the extension to the Halifax River as soon as possible. The road is now completed from the St. Johns River opposite Jacksonville, Fla., southeast to St. Augustine, 36 miles. It is of 3 ft. gauge.

Kansas City Belt.—Work has been begun on this road, which is to extend around Kansas City, Mo., connecting all the roads entering the city. It is expected that it will take about a year to finish the work. It will be built by the Kansas City, Fort Scott & Gulf Co., but will be open to the use of all the roads.

Kansas Railroad Commission.—A dispatch from Topeka, Kan., Nov. 7, says: "The railroad managers and the Board of State Commissioners met this morning, but the railroad managers would not agree and the meeting ended in confusion. The Board directed that the Beloit decision must go into effect on Nov. 10. After consultation the railroad managers sent the Board of Commissioners a request that they continue the conference and have another meeting with the managers, at which an adjustment of freight rates could be agreed upon. They also asked that the Beloit decision be suspended until an agreement was arrived at. This the Board refused. Then a committee appointed by the managers prepared and presented an address requesting the continuance of the conference for the purpose of agreeing upon an adjustment of rates upon a fair and equitable basis, and that, pending such a conference, the Beloit decision be held in abeyance. The Board replied that it was willing to suspend the Beloit decision pending a conference with the managers with a view to formulating and agreeing upon a schedule of freight rates to be used by the several railroads in the state, with the understanding that the managers desire to meet the Board in a spirit of fairness and concision and with an honest desire to reach a just and satisfactory conclusion, providing that such meeting shall take place by Nov. 12."

Long Island.—The gross earnings of this road for the fiscal year ending Sept. 30 were as follows:

	1882-83.	1881-82.	1880-81.
Passengers.....	\$1,094,388	\$1,008,771	\$1,237,837
Freight.....	719,298	634,698	586,203
Other sources.....	272,493	166,164	75,932
Total.....	\$2,086,179	\$2,409,633	\$1,899,972

The year just closed shows an increase over 1881-82 of \$276,546, or 11.5 per cent., and an increase over 1880-81 of \$786,207, or 41.4 per cent.

Mexican National.—The *Mexican Financier* of Oct. 20 says: "Sr. Ibarrola, the government inspector of the Mexican National, has submitted his report on the line between Acámbaro and Morelia. Leaving the junction with the Northern Division at Acámbaro the line begins to rise with various grades, none of which, however, exceed a maximum of 17 millimetres until reaching the Guasacaca Pass, at a height of 237.32 metres above Acámbaro. It traverses the pass in a cut of 27 metres deep, through hard tepetate. At this point begins the descent to the station of Andocutin and the banks of the lake of Cuizco. This first section is about 13 kilometres long. Following the devious line of the lake shore, the road runs about 40 kilometres to the Temascal or Queréndaro River, having descended from the aforementioned pass about 136 metres without encountering anywhere a grade of more than 10 millimetres. Passing that river the line traverses by a tangent of over 7 kilometres the greater part of the very rich valley which, beginning in Tarimbaro, extends to Queréndaro, being the basin of the salt lake to which the village of Cuizco, on the north shore, gives its name. Sixty kilometres from Acámbaro the line touches the lower end of the hacienda of Zacapendo, in the secondary valley of the Morelia River, whose right bank the track follows as far as Morelia, a distance of 91½ kilometres from Acámbaro. On all this section, from Andocutin to Morelia the maximum grade does not exceed six millimetres. The station of Morelia is 156 metres higher than that of Acámbaro. The road-bed throughout the whole line is very good and the superstructure is well built, the short distance between the ties being notable, there being 19 ties to a rail of 80 English feet, thus giving all the desired

security. Works of well-constructed masonry are very numerous on this section. Between Acámbaro and Andocutin there are 75 works of the kind, besides six solidly built trestle-bridges. Between Andocutin and Morelia, near Charo and on the hacienda of Atapaneo, two trestles have been built for the secure passage of water in time of floods, and these will be replaced by permanent structures as soon as the season permits. On this section there are 207 culverts and bridges and two retaining walls, one 37 metres long and the other 19 metres long. There is a bridge 22.90 metres span over the Temescal or Queréndaro River, with piers of good masonry, with a superstructure of wood which for a short time will serve as a frame-work for the placing in position of the permanent iron bridge, now on the way. Altogether the section between Andocutin and Morelia is one of the best adapted to open to traffic with perfect security."

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Oct. 6:

It is said that the grading of the Mexican Meridional, or Gould-Grant railway, will shortly be completed to Victoria, the capital of Tamaulipas.

A diligence-line, running three times a week, has begun to run between Durango and Villa Lerdo, connecting with the Mexican Central at the latter point.

On the evening of Oct. 2 track-laying on the Southern Division of the Mexican Central had reached kilometre 603, which is 18 kilometres beyond Aguascalientes.

Progress is reported on the Central Table-land Railway, which is an unsubsidized line. It will shortly, it is claimed, place Talpam in direct steam-communication with the Capital and early next year it is believed that the line will reach Cuernavaca, the capital of Morelos, whence the tracks will run across the states of Mexico and Michoacan to the Pacific Coast.

We learn on the best authority, that Mr. Sheridan has carried through successfully the capitalization in London of the Mexico & Tuxpan Railway, known as the Mancera concession. This line will bring the Capital within eight hours of the coast at a port which may easily be made accessible to deep draught vessels, and over a route with easy grades. Whether the gauge is to be changed in order to furnish a connection to the Capital for the Telefener Railway, does not yet appear.

There appears to be reason to believe that the transfer of the Inter-oceanic, Acapulco, Morelos, Mexico, Irolo & Vera Cruz Railway concession to London parties has been accomplished. Mr. Delfin Sanchez, the leading man in the enterprise, has been for some time in London endeavoring to affect this end. Several links of this railway being already built it could speedily be pushed to a completion. Reconnoissances of the line to Acapulco show that easy grades between the Capital and that port are perfectly feasible, the highest being not over 2 per cent, although it had been feared that this part of the line would be characterized by great difficulties, with almost insurmountable grades. There is a rumor that the purchasers of the line are the Vera Cruz Railway Co., which has adopted the measure in self-defense.

The International Railway, according to latest advices, had reached within 60 miles of Saltillo, and the survey was complete to that point. The line runs through Santa Rosa and Monclova on the way to Saltillo. From Saltillo it takes a direction a little south of west towards Parras, where it strikes a fine vineyard region. Thence it will probably run to Zacatecas and across the Sierras to the Pacific coast at Mazatlan, though there is said to be some likelihood that it may run through Durango on its way to the coast. While that would be a longer way around to reach Mazatlan, possibly the line may be easier. It is said to be the intention of the company to run to the Capital, but by what route is not known, whether by the short line direct south from Saltillo or from Zacatecas. The latter part of the line would probably receive no subsidy.

The following items are from the *Mexican Financier* of Oct. 13:

The Mexican National is now running its trains regularly to Morelia and Celaya, and the business of the line is improving in consequence.

The Governor of Coahuila received a telegram on Sept. 23 announcing that on that day a locomotive of the Mexican Central had crossed the bridge over the Rio Nazas and entered upon the soil of Coahuila.

Mr. Nickerson, the President of the Mexican Central, writes to Mr. Sebastian Camacho that the line from here to the United States will be completed by March 1 next. The road will be opened to traffic for some time before the official celebration of its completion, which will probably take place on May 5, the national holiday. Mr. Nickerson has been making a tour of inspection over the northern end of the line.

Mr. Early, one of the ablest engineers of the Mexican Central corps, and recently Chief Locating Engineer on the Northern Division, has been appointed Chief Engineer of the Pacific Division; an admirable appointment which seems to indicate that work on that part of the Mexican Central system will be pushed as soon as the main line is finished. A connection with the important city of Guadalajara will naturally be most desirable as speedily as possible, and will be greatly to the profit of the company.

The government inspector of the line of the Mexican Central from San Luis Potosí to Tampico, in his report for September, says that after the reconnaissance of the route through the pass of San José, between the hacienda de Cardenas and San Luis Potosí, the Chief Engineer decided to revise the other line through Rio Verde and the cañon of the same name; therefore a section of engineers under the direction of Mr. Koon is now examining the latter route in order to obtain better data before deciding which of the two to choose. On the Eastern Division the construction of the bridge of Morallillo over the Rio Tamesi has continued. The track has been laid as far as kilometre 114. The number of men employed was 1,605. The number of passengers carried was 121 and the number taken east was 114. On the Mountain Division the number of men employed was 1,610.

The notes below are taken from the *Mexican Financier* of Oct. 20:

The Matamoros & Monterey line of the Mexican National was completed, at last account, 74 kilometres out from Matamoros. Smith's grading party was 98 kilometres out and his camp was at the 100th kilometre. This year's contract will be completed 107 kilometres out from Matamoros.

Mr. John Meyers, of San Francisco, Cal., who has carried out a large number of successful contracts in Central America, has taken a contract to build 40 kilometres of the Tehuantepec Railway, on the Pacific side, beginning about four kilometres out from Tehuantepec, to which the line has already been built. Mr. Meyers left for Tehuantepec last Tuesday morning, by way of Oaxaca, accompanied by Mr. J. B. Marshall as book-keeper, and several men to take charge of ballasting, track-laying, etc. Mr. Meyers has contracted to finish the work within five months from Nov. 15. This 40 kilometres is the easiest part of the line to build.

Michigan Central.—The new bridge of the Canada Southern Division over the Niagara River at Niagara Falls has now entered upon the most interesting portion of its construction—that of building the centre span, 500 ft. in

length, without any support from below. On the American side the section above the steel tower was completed on Wednesday, Oct. 31, and on Thursday the connection chords and the large steel posts for the next section were put in place. On the Canada side the traveler was completed on Wednesday, and on Thursday the posts for the towers were lowered to their place. This work has attracted large crowds of spectators, and is of a character to make those watching it dizzy, if it does not the workmen themselves. The traveler that is used in constructing across the river is 66 ft. long, 38 wide, and 24 ft. high. It contains 30,000 ft. of timber, and tons of bolts, rods and stays. It stands on the top of the bridge and projects over the completed end 40 ft. The part that rests on the bridge is secured to it by great iron claws, and it has at its projecting end an uplifting capacity of 40 tons. It carries with it as it voyages across the river a steam engine, two powerful derricks, and innumerable pulleys, blocks and sheaves of the most improved and powerful build. To facilitate the work, the traveler carries with it also two large wooden platforms, which rest immediately under the work being done. Each of these platforms is 38 ft. long and 12 ft. wide, and as it now hangs is 42 ft. from the top of the traveler and 200 ft. above the water of the rapids below. As the construction proceeds across the river, the distance from the top to bottom of the bridge lessens, and the holders of the platforms are made in sections, so that they may be easily shortened when the section of the bridge is completed and the traveler is moved forward.

Missouri, Kansas & Texas.—The directors of this company have resolved to issue \$10,000,000 additional bonds under the consolidated mortgage, for the purpose of retiring the second mortgage income bonds now outstanding. The new consolidated bonds will bear 5 per cent. interest. The following notice to holders of the second-mortgage income bonds and scrip has been issued, under date of Nov. 2:

"The directors of this company have this day authorized the issue of 5 per cent. bonds, under and pursuant to the provisions of its general consolidated mortgage of Dec. 1, 1880, in exchange for the company's second-mortgage income bonds, dollar for dollar, when presented in even sums of \$1,000. Said 5 per cent. bonds to bear interest from Oct. 1, 1883, payable semi-annually in June and December, and to run until Dec. 1, 1924.

"The past due coupons of income bonds, together with scrip representing such coupons, may also be changed at 60 per cent. of their face value flat for said 5 per cent. bonds at par.

"Pending the preparation of the new bonds, the income bonds and scrip may be presented at company's office, No. 195 Broadway, New York, on and after Nov. 7, to be stamped as assenting to the exchange on the above terms until further notice."

New Brighton & New Castle.—The United States Circuit Court has granted a motion to quash the injunction against the construction of this road at Rock Point, Pa., where the Pittsburgh, Cleveland & Toledo Co. disputed the right of way, provided bonds are filed to cover damages to property owners. Another injunction suit has yet to be heard.

New York, Lake Erie & Western.—The Attorney-General of Pennsylvania has decided to begin a suit in the nature of a *quo warranto*, requiring this company to show by what right it claims to build and maintain the road from Crawford Junction to Johnsonburg in that State. The road in question was built under the charter of the New York, Lake Erie & Western Coal & Railroad Co., but the claim in the Attorney-General's complaint is that the charters of the companies which were consolidated to form that corporation had been granted before the adoption of the present constitution of the state, and lapsed when that instrument went into effect.

Norfolk & Western.—In the table of earnings for September, given last week, the earnings of this road for September, 1883, and consequently the earnings per mile, were too small. This arose from the fact that the company's completed statement of earnings for the month did not reach us until too late for use in the table, and the amount there given was the *estimated* earnings, as previously published, which were considerably less than the amount as finally audited.

The New River Division of 75 miles was opened for traffic May 21 last, and the gross earnings per mile of the whole line for each month since May have been as follows, on 503 miles worked this year and 428 miles in 1882:

	1883.	1882.	Inc. or Dec.	P. c.
June.....	\$405	\$409	D. \$4	0.98
July.....	436	448	D. 12	2.68
August.....	520	519	I. 1	0.19
September.....	570	544	I. 26	4.78
Average per month.....	\$483	\$480	I. \$3	0.63

This may be considered a very good showing, in view of the fact that 75 miles, or 14.9 per cent. of the mileage of the road this year, is a new branch in entirely new country.

Northern Pacific.—In the Field suit to enjoin the company from issuing second-mortgage bonds, which had been transferred to the United States Circuit Court on petition of the company, that Court has vacated the injunction. The plaintiffs in the suit, however, claim that, while the injunction is vacated as far as the company is concerned, the original injunction as granted by the New York Superior Court holds good against the directors as individuals.

A large number of men have been discharged from the St. Paul shops, and the working force of the road is to be cut down at all points where a reduction is possible. It is stated that this is the beginning of a policy of severe economy which is to be adopted in all departments of the road.

Ogdensburg & Lake Champlain.—This company makes the following statement for September and the six months of the fiscal year from April 1 to Sept. 30:

	September—1883.	September—1882.	Six Months—1883.	Six Months—1882.
Earnings.....	\$72,300	\$73,000	\$351,700	\$334,500
Expenses.....	44,300	41,800	250,500	269,000
Net earnings.....	\$27,900	\$31,200	\$101,200	\$87,500
Per cent. of expenses.....	61.4	57.3	71.2	75.5

This shows for the six months a decrease in gross earnings of \$4,800, or 1.3 per cent., with a decrease in expenses of \$18,500, or 6.9 per cent., the result being an increase in net earnings of \$13,700, or 15.6 per cent.

Ohio & Guyandot.—Contracts are shortly to be let for the grading of 60 miles of this road, running from Ceredo, W. Va., on the Chesapeake & Ohio road and the Ohio River, southeast up Twelve-mile River to the coal-fields of Logan County. The intention is to continue the road to a junction with the New River Branch of the Norfolk & Western.

Ohio River.—At latest dates the tracklayers on this road had reached a point 14 miles northward from their starting point at Parkersburg, W. Va., and the work was progressing steadily. The section now under construction is

from Parkersburg up the east bank of the Ohio to Benwood, 4 miles below Wheeling, a distance of 90 miles.

Panama Canal Co.—This company has just published the scale of allotments for the recent issue of 600,000 bonds of \$100 each, amounting to \$60,000,000. The number of applicants is 106,000; 18,600 shareholders or bondholders of the Panama Canal Co. have applied for 128,986 bonds, thus leaving 471,014 bonds to be allotted between 87,440 subscribers, whose applications are liable to reduction. The applications for single bonds number 50,685, while 80,208 persons have subscribed from one to 10 bonds, the number thus applied for amounting to 180,925 bonds. These two categories will receive amount in full. The applicants for more than 10 bonds have subscribed for 341,404 bonds, and have to divide among themselves 290,089 bonds. These applications have been reduced 15 per cent.

Pennsylvania.—At the meeting of the board held Nov. 1 the following resolution was adopted:

"Resolved, That the board of directors do hereby declare a semi-annual dividend of 4½ per cent. upon the capital stock of the company, out of the profits, clear of all taxes, payable in cash on and after Nov. 30, 1883, to the shareholders as they stood registered on the books of the company, at 3 o'clock p. m., Oct. 31, ultimo. And in order that shareholders may have the option of converting 2 per cent. of this dividend into the capital stock of the company at par, certificates shall be issued as the time the dividend is collected, representing such amount, which shall be exchanged for the capital stock at par prior to Feb. 1, 1884, when presented in sums of \$50."

The 4½ per cent. in cash on the capital stock amounts to \$4,068,872. Supposing all the stockholders should exercise the option to take scrip, the cash dividend would be \$2,260,484 and the increase in stock \$1,808,387. As the stock is now selling at about \$55.50 per share, or 113, ex-dividend, the dividend taken in cash and scrip would amount to about 4½ per cent.

Pike's Peak.—A preliminary survey has been completed for a narrow-gauge railroad from Manitou, Col., to the summit of Pike's Peak. The line as surveyed curves around the mountain, rising as gradually as the nature of the ground will permit, and reaches the summit at a distance of 30 miles by the survey from Manitou. The maximum grade will be 300 ft. to the mile. The traffic will be chiefly in passengers, and the trains to be used on these grades can be made very light.

Raleigh & Gaston.—The shops of this road at Raleigh, N. C., are thus described by the *News and Observer* of that city: "The car-shop is of brick and wood, 1½ stories high, its floor dimensions being 86 by 85. Here the cars are built, box, flat and passenger, and very beautiful indeed is the style of the work done, as all who have seen the cars of the road will at once agree. The machinery is quite good, among the machines being Goodell & Walters planers, which dress at one operation all the four sides of car sills 10 by 14 in. Just east is the car shed, 210 by 40 ft., in which the passenger cars are sheltered and cleaned. East of this is the paint shop, 120 by 40 ft. This building, of brick, was put up only two years ago. Near by are the storehouses, all of brick, fire proof, with iron shutters and doors, the largest storehouse being 80 by 60 ft."

"North of all these stand the engine shops, round-house and foundry. These are all connected. The shops and foundry under one roof are 200 by 75, and contain over \$30,000 worth of machinery. The round-house, which is circular, has a diameter of 140 ft., and contains 22 engines. This round-house was built in 1858, but the great roof, of corrugated iron, was not put on until 1872. The engine which runs the machinery is of 80 horse-power."

Richmond & Allegheny.—The *Virginian* for October says: "This road since it passed into the hands of Receivers Myers and Axtell has increased its receipts over 40 per cent. The Receivers are constructing or rebuilding a number of wagon bridges across James River, which is followed by this railway, thereby, in fact, doubling its tributary country. The bondholders are now considering a request of the Receivers to be allowed to build branch lines to mines, furnaces, etc. If this is granted there will soon follow a large development of the fine mineral regions in Virginia that are naturally tributary to this railway."

St. John Bridge.—The railroad bridge over the St. John River at St. John, N. B., which is to connect the St. John & Maine and the Intercolonial roads, is being rapidly pushed. The pier for the bridge on the north side of the falls is rapidly rising, though the men have had an opportunity to work only at low tide, but very soon this difficulty will be overcome. The levels for the pier on the south bank have been obtained, and on account of the change in the original plans, that one will be constructed with much less difficulty than the other. About three-fourths of a mile of the line through Portland is in process of grading, including several very extensive fillings, with heavy cuttings. The grading and bridge work will be continued through the winter, but the masonry work on the piers at the falls will be suspended as soon as frosty weather sets in, to be resumed early in the spring, when 300 men will be employed to push the work along, that it may be completed by the specified time, Aug. 15, 1884.

Sioux City & Pacific.—The trains of this road are now using the new bridge over the Missouri, between Missouri Valley, Ia., and Blair, Neb. The General Passenger Agent gives notice of this fact, and also that there will hereafter be no delay during the winter at the Missouri River transfer, as has been the case heretofore, when the transfer was made by ferry.

Texas & Pacific.—Some of the holders of the land grant and income bonds have decided not to accept the scrip offered by the company in payment of interest for 1882 and 1883. They claim that by its omission to exercise the option of payment in scrip at the proper time, the company has made itself liable to pay the interest in cash, and they intend to bring suit to enforce such payment.

Toledo, Cincinnati & St. Louis.—The round-house of this road was destroyed by fire on the night of Nov. 3, and six engines in it were very badly damaged. The loss is estimated at \$75,000, with no insurance. The fire was caused by a boy dropping a torch in a lot of waste in the store-room.

Toledo & Indianapolis.—The United States Circuit Court, in Cleveland, O., has granted the application of the creditors for the appointment of a receiver for this road. The road is in operation from Toledo, O., to Findlay, 44 miles. The floating debt is said to be about \$560,000; no bonds have been sold, but \$600,000 have been issued and hypothecated as security for floating debt.

Union Pacific.—In the *quo warranto* suit brought by the Attorney General of Kansas in the Supreme Court of that State, the answer of the company has been filed. It alleges that the Kansas Pacific Co., now part of the Union Pacific by consolidation, is not a corporation created by any law of the territory or state of Kansas, and claims no right and privileges of franchise as such. It alleges that it was created by an act of Congress; that by virtue of the rights

conferred by that act it was organized, built its line of road, and under such authority it has ever since been operated and still continues to operate its line of road; that the railroad constructed is on a different line than that designated by the territorial act and that the consolidation it has entered into with the Union Pacific and Denver Pacific Railroad companies was made under authority found in the act of Congress creating it and not under any act made by the state. It denies any right of the state to forfeit its franchises, and claims that the paramount control over it exists solely in the government of the United States. It closes with a general denial of all of the allegations in the petition not expressly admitted.

Utica, Ithaca & Elmira.—This company will establish its repair shops at Cortland, N. Y., a bonus of \$3,000 having been offered by that town. The company has bought the old nail factory buildings in Cortland.

Valley of Virginia.—The track on this road is now laid to Lexington, Va., 86 miles south by west from the old terminus at Staunton, and 62 miles from the northern terminus at Harrisburg. The road was opened for traffic to Lexington, Nov. 1. It is operated by the Baltimore & Ohio Co., which owns a controlling interest in it.

Warrior Coal Fields.—Surveys have been begun for this road from Gainesville, Ala., northward to Bridgeville, about 25 miles. Two lines will be run, one on each side of the Tombigbee River.

Wilmington & Northern.—This company, it is said, is considering the question of building a branch from its line near Chadd's Ford, Pa., to West Chester. The distance is about 5 miles.

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Connecticut River.

This company owns a line from Springfield, Mass., to South Vernon, 50 miles, with branches to Chicopee, 2.35 miles, and to Easthampton, 3.50 miles. It leases the Ashuelot road, from South Vernon to Keene, N. H., 24 miles, making 79.85 miles worked. The following statements are from the report to the Massachusetts Railroad Commission for the year ending Sept. 30 last.

The stock of the company is \$2,370,000; it has no bonded debt.

The passenger and freight traffic carried were as follows:

1882-83. 1881-82. Increase. P. c.
Passengers carried.....1,484,155 1,407,069 77,086 5.5
Tons freight carried.....632,865 595,621 37,244 6.3

Of the passengers carried 164,406 were through, and 1,319,749 local passengers.

The earnings for the year were as follows:

1882-83. 1881-82. Inc. or Dec. P. c.
Freight.....\$475,249 \$454,386 I. \$20,863 4.6
Passengers.....366,732 356,793 I. 10,939 3.0
Mail, etc.....77,038 38,235 I. 38,803 101.0

Total.....\$919,029 \$849,424 I. \$69,605 8.2
Expenses.....\$647,268 \$615,594 I. \$31,674 5.1

Net earnings.....\$271,771 \$233,830 I. \$38,341 16.4
Gross earn. per mile.....11,510 10,633 I. 877 8.2
Net.....3,404 2,925 I. 481 16.4
Per cent. of exps.....70.43 72.50 D. 2.07

The expenses include \$37,595 paid for new construction and permanent improvements of the road.

The usual 8 per cent. dividends on the stock were paid, amounting to \$189,600, leaving a balance of \$82,171 for the year.

Lake Erie & Western.

This company owns a line from Sandusky, O., to Bloomington, Ill., 376.8 miles, with a branch from St. Mary, O., to Minster, 9.2 miles, making 386 miles in all. The following statements for the year ending June 30 last are from the report made by the company to the Railroad Commissioner of Ohio.

The general account is as follows, condensed:

Stock.....\$7,700,000
Funded debt.....7,897,000
Accounts and balances.....627,226

Total.....\$16,194,226

Road and equipment.....\$15,750,704
Materials.....27,813
Accounts and balances.....39,808
Cash.....31,623
Profit and loss, debit balance.....344,478

16,194,226

The funded debt consists of \$2,500,000 LaFayette, Bloomington & Muncie first-mortgage and \$1,000,000 income bonds; \$327,000 Sandusky Extension first-mortgage and \$600,000 income bonds; \$1,815,000 general first-mortgage and \$1,485,000 income bonds, and \$140,000 car trust bonds.

The earnings for the year were as follows:

1882-83. 1881-82. Inc. or Dec. P. c.
Earnings.....\$1,593,523 \$1,424,513 I. \$169,010 11.9
Expenses.....1,304,389 1,144,089 I. 160,299 14.3

Net earnings.....\$289,134 D. \$83,890 29.0

Gross earn. per mile.....3,895 3,680 I. 215 5.6

Net earn. per mile.....516 733 D. 217 29.6

Per cent. of exps.....80.76 80.13 I. 0.63

A large part of the traffic of the road is necessarily taken under competition and at very low rates, which in part accounts for the high proportion of working expenses to earnings. The net earnings amounted to 2.53 per cent. upon the total amount of funded debt.

The income account was as follows:

Net earnings, as above.....\$289,134

Rentals.....\$9,645

Interest on bonds.....278,520

Interest on floating debt.....12,123

300,298

Deficit for the year.....\$101,164

In addition there were payments reported of \$130,547 for new construction and \$43,534 for additional equipment, making a total excess of \$275,245 in payments over the net earnings for the year.

Evansville & Terre Haute.

This company owns and operates a line from Evansville, Ind., north to Terre Haute, 109 miles, with a branch from Owensville Junction to Mt. Vernon, 37 miles, making 146 miles in all. It also owns a branch from Terre Haute to Rockville, 23 miles, which is leased to the Terre Haute & Logansport Co. The report is for the year ending Aug. 31.

The equipment consists of 26 locomotives, 20 passenger-train cars, 1,026 freight cars and 85 road and service cars. There was an increase during the year of 2 locomotives, 2 passenger cars and 106 freight cars.

The general account is as follows, condensed:

Stock.....\$3,000,000
Funded debt.....4,297,000
Bills and accounts payable.....180,697
Income account.....460,552

Total.....\$7,838,249

Road and property.....\$6,472,056

Company's bonds in treasury.....1,097,000

Stocks and bonds owned.....78,000

Materials.....45,532

Bills and accounts receivable.....223,457

Cash.....22,210

7,838,249

The funded debt consists of \$922,000 first mortgage 7 per cent. bonds; \$375,000 Mt. Vernon branch 6 per cent. bonds, and \$3,000,000 consolidated 6 per cent. bonds. Of these \$175,000 Mt. Vernon Branch bonds and \$922,000 consolidated bonds are held by the company.

The traffic for the year was as follows:

1882-83. 1881-82. Inc. or Dec. P. c.

Passengers carried.....255,565 255,142 I. 423 0.2

Passenger-miles.....8,153,762 7,781,101 I. 372,661 4.8

Tons freight carried.....424,555 563,422 D. 138,867 12.2

Top-miles.....42,921,390 47,480,947 D. 4,559,557 9.6

Average rate:

Per passenger-mile.....2.60cts. 2.80cts. D. 0.20 ct. 7.1

Per ton-mile.....1.04 " 1.14 " D. 0.10 " 8.8

The increase in passenger traffic was considerable, chiefly in local business. The decrease in freight traffic was also chiefly in local shipments. The average passenger journey last year was 27.6 miles; the average freight haul was 86.8 miles.

The earnings for the year were as follows:

1882-83. 1881-82. Inc. or Dec. P. c.

Freight.....\$440,067 \$543,418 D. \$103,351 23.7

Passengers.....211,248 208,399 I. 2,849 1.4

Mail, etc.....91,435 74,920 I. 16,515 22.0

Total.....\$751,690 \$826,747 D. \$75,057 9.0

Expenses.....387,228 451,645 D. 64,417 14.3

Net earnings.....\$364,462 \$375,102 D. \$10,640 2.7

Gross earn. per mile.....5,149 5,060 D. 89 1.7

Net.....2,496 2,565 D. 69 2.7

Per cent. of exps.....51.51 54.05 D. 2.54

The reduction in freight earnings was due to a reduction in rates as well as to a decrease in the amount of traffic.

The income account was as follows:

Net earnings, as above.....\$364,462

Interest on debt.....191,770

Balance, surplus for the year.....\$169,692

No dividends were paid last year; in the previous year one of 2 per cent. was paid.

The President's report says: "Business for the fiscal year up to June 30 fully maintained last year's results, but July and August fell off immensely. All in the hauling of wheat. In July, 1883, we hauled 3,000,000 bushels of wheat; in July, 1882, we did not haul 200,000 bushels. We grew a good crop, but the prices were below the views of values by the farmers, so the wheat is all still in the country. We have magnificent crops of corn, grass, potatoes, cabbage and fruits, and will certainly have a large business for the new year. While we lost materially in gross business, our net nearly reaches our figures of last year, and we operate at a per cent. rarely attained.

"The last five miles of iron in your main line have been replaced with 60 lb. steel, making your main line, Evansville to Terre Haute—109 miles—all first-class steel. Our roadway is maintained to its high standard of excellence, and the usual renewals of ties and gravel have been placed upon it."